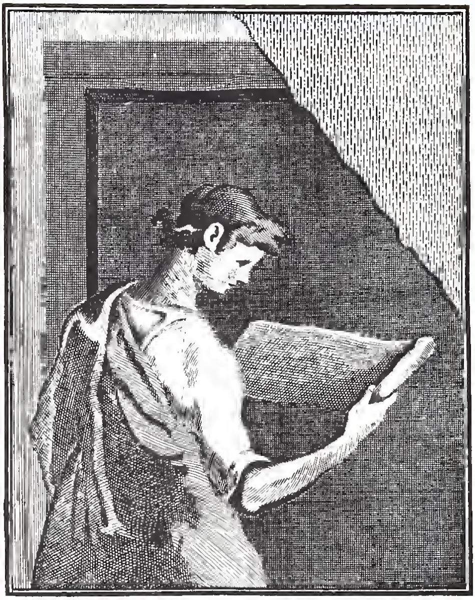
# The American Annual of Photography and Photographic Times Almanac

1906



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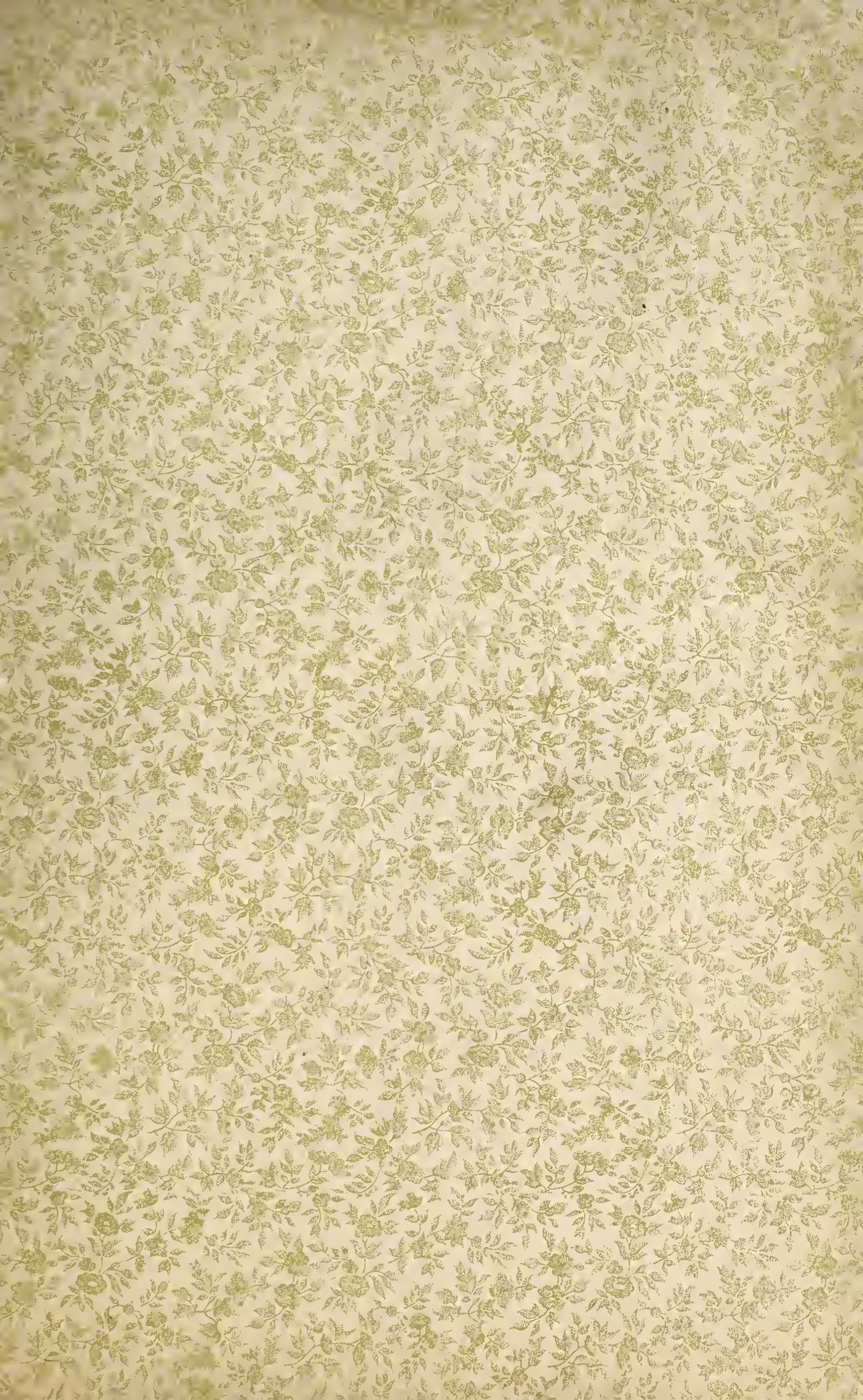

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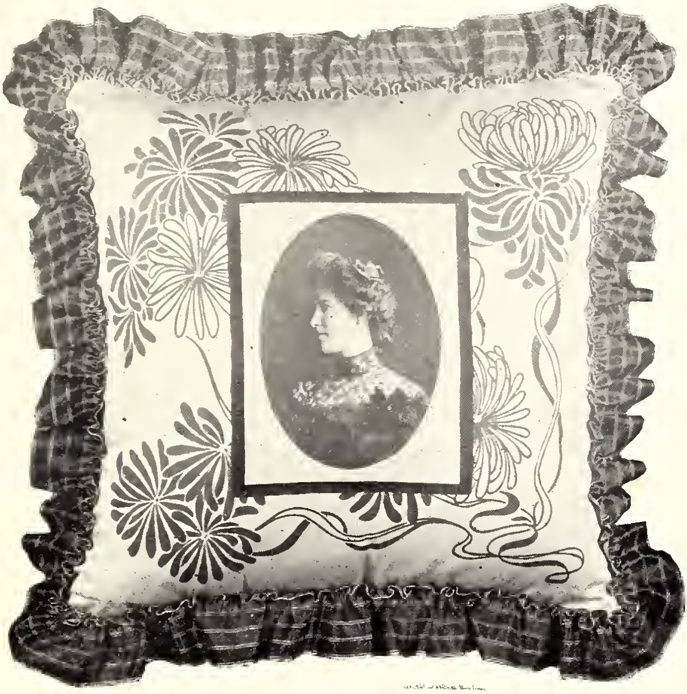

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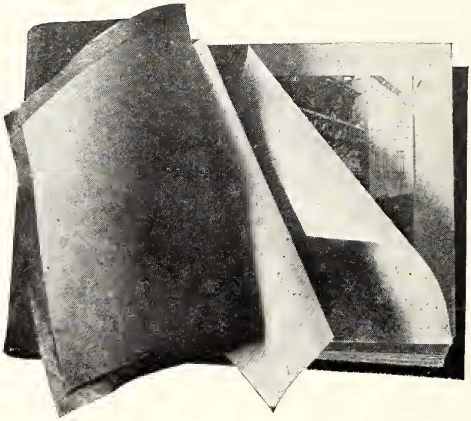

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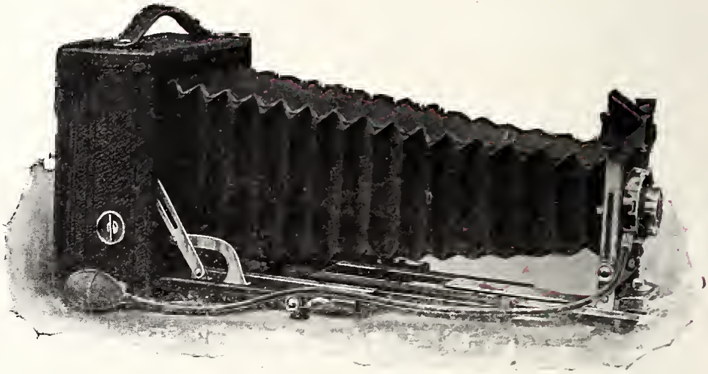

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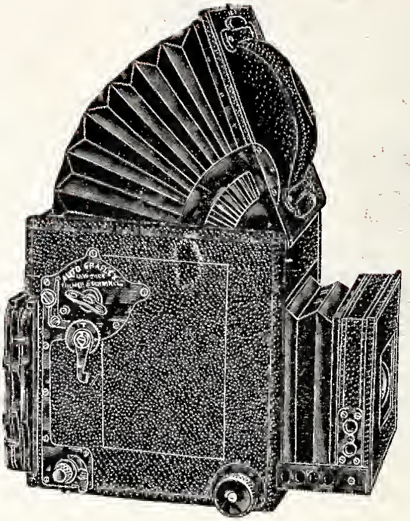

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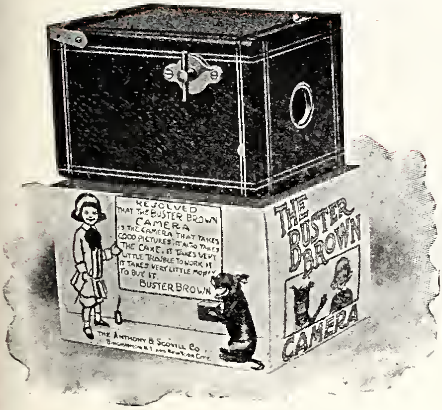
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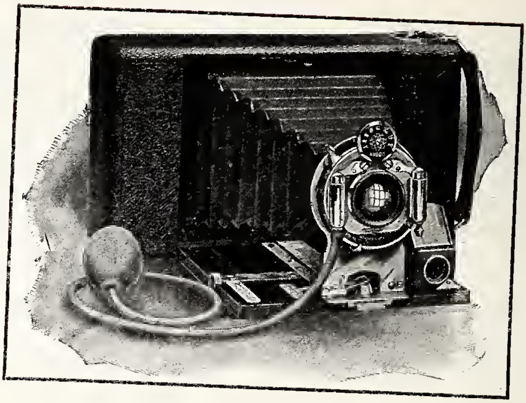

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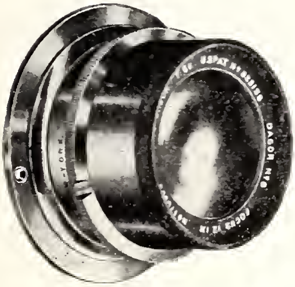

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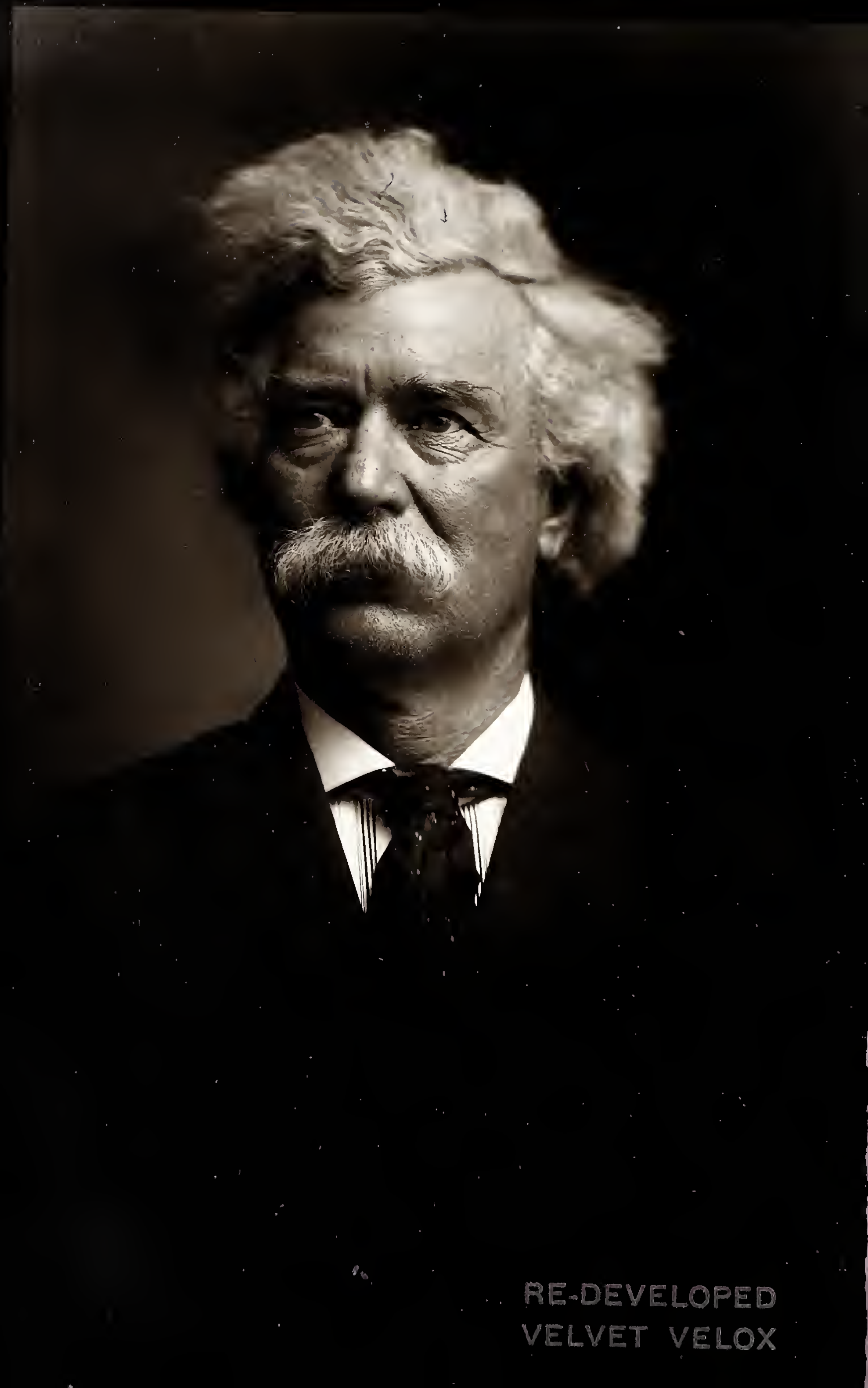
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# The American Annual of Photography and Photographic Times Almanac for 1906

Edited by W. I. Lincoln Adams and Spencer Hord
Editors of The Photographic Times

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# Preface.

In presenting the twentieth volume of THE AMERICAN ANNUAL OF PHOTOGRAPHY we wish to express our hearty thanks for the cordial manner in which our endeavors have been encouraged and supported by the American photographic fraternity.

We also wish to render due credit to our contributors without whose intelligent and willing coöperation the work would have been impossible.

The Editors.

November, 1905.

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## January, 1906.

**1st Month. 31 Days.**

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. Sun rises. H. M. | N. Y. City. Sun sets. H. M. |
|---|---|---|---|---|
| 1 | **1** | M | 7 25 | 4 43 |
| 2 | **2** | Tu | 7 25 | 4 44 |
| 3 | **3** | W | 7 25 | 4 45 |
| 4 | **4** | Th | 7 25 | 4 46 |
| 5 | **5** | F | 7 25 | 4 47 |
| 6 | **6** | Sa | 7 25 | 4 48 |
| 7 | **7** | 𝔖 | 7 25 | 4 49 |
| 8 | **8** | M | 7 24 | 4 50 |
| 9 | **9** | Tu | 7 24 | 4 51 |
| 10 | **10** | W | 7 24 | 4 52 |
| 11 | **11** | Th | 7 24 | 4 53 |
| 12 | **12** | F | 7 23 | 4 54 |
| 13 | **13** | Sa | 7 23 | 4 55 |
| 14 | **14** | 𝔖 | 7 23 | 4 56 |
| 15 | **15** | M | 7 22 | 4 57 |
| 16 | **16** | Tu | 7 22 | 4 59 |
| 17 | **17** | W | 7 21 | 5 00 |
| 18 | **18** | Th | 7 21 | 5 01 |
| 19 | **19** | F | 7 21 | 5 02 |
| 20 | **20** | Sa | 7 20 | 5 03 |
| 21 | **21** | 𝔖 | 7 19 | 5 04 |
| 22 | **22** | M | 7 18 | 5 05 |
| 23 | **23** | Tu | 7 17 | 5 07 |
| 24 | **24** | W | 7 17 | 5 08 |
| 25 | **25** | Th | 7 16 | 5 09 |
| 26 | **26** | F | 7 16 | 5 10 |
| 27 | **27** | Sa | 7 15 | 5 11 |
| 28 | **28** | 𝔖 | 7 14 | 5 13 |
| 29 | **29** | M | 7 13 | 5 14 |
| 30 | **30** | Tu | 7 12 | 5 15 |
| 31 | **31** | W | 7 12 | 5 16 |

## February, 1906.

**2d Month. 28 Days.**

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. Sun rises. H. M. | N. Y. City. Sun sets. H. M. |
|---|---|---|---|---|
| 32 | **1** | Th | 7 11 | 5 18 |
| 33 | **2** | F | 7 10 | 5 19 |
| 34 | **3** | Sa | 7 09 | 5 20 |
| 35 | **4** | 𝔖 | 7 07 | 5 21 |
| 36 | **5** | M | 7 06 | 5 22 |
| 37 | **6** | Tu | 7 05 | 5 23 |
| 38 | **7** | W | 7 04 | 5 25 |
| 39 | **8** | Th | 7 03 | 5 26 |
| 40 | **9** | F | 7 02 | 5 27 |
| 41 | **10** | Sa | 7 01 | 5 28 |
| 42 | **11** | 𝔖 | 7 00 | 5 30 |
| 43 | **12** | M | 6 58 | 5 31 |
| 44 | **13** | Tu | 6 57 | 5 32 |
| 45 | **14** | W | 6 56 | 5 34 |
| 46 | **15** | Th | 6 55 | 5 35 |
| 47 | **16** | F | 6 53 | 5 36 |
| 48 | **17** | Sa | 6 52 | 5 37 |
| 49 | **18** | 𝔖 | 6 51 | 5 39 |
| 50 | **19** | M | 6 49 | 5 40 |
| 51 | **20** | Tu | 6 48 | 5 41 |
| 52 | **21** | W | 6 46 | 5 43 |
| 53 | **22** | Th | 6 45 | 5 44 |
| 54 | **23** | F | 6 44 | 5 45 |
| 55 | **24** | Sa | 6 42 | 5 46 |
| 56 | **25** | 𝔖 | 6 41 | 5 48 |
| 57 | **26** | M | 6 39 | 5 49 |
| 58 | **27** | Tu | 6 38 | 5 50 |
| 59 | **28** | W | 6 37 | 5 51 |

## March, 1906.

### 3d Month. 31 Days.

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. | |
|---|---|---|---|---|
| | | | Sun rises. | Sun sets. |
| | | | H. M. | H. M. |
| 60 | **1** | Th | 6 35 | 5 53 |
| 61 | **2** | F | 6 34 | 5 53 |
| 62 | **3** | Sa | 6 32 | 5 54 |
| 63 | **4** | 𝕾 | 6 30 | 5 55 |
| 64 | **5** | M | 6 29 | 5 56 |
| 65 | **6** | Tu | 6 27 | 5 57 |
| 66 | **7** | W | 6 25 | 5 58 |
| 67 | **8** | Th | 6 24 | 5 59 |
| 68 | **9** | F | 6 22 | 6 00 |
| 69 | **10** | Sa | 6 20 | 6 01 |
| 70 | **11** | 𝕾 | 6 19 | 6 02 |
| 71 | **12** | M | 6 17 | 6 03 |
| 72 | **13** | Tu | 6 16 | 6 04 |
| 73 | **14** | W | 6 14 | 6 05 |
| 74 | **15** | Th | 6 12 | 6 06 |
| 75 | **16** | F | 6 11 | 6 08 |
| 76 | **17** | Sa | 6 09 | 6 09 |
| 77 | **18** | 𝕾 | 6 07 | 6 10 |
| 78 | **19** | M | 6 06 | 6 11 |
| 79 | **20** | Tu | 6 04 | 6 12 |
| 80 | **21** | W | 6 02 | 6 13 |
| 81 | **22** | Th | 6 01 | 6 14 |
| 82 | **23** | F | 5 59 | 6 15 |
| 83 | **24** | Sa | 5 58 | 6 16 |
| 84 | **25** | 𝕾 | 5 56 | 6 17 |
| 85 | **26** | M | 5 54 | 6 18 |
| 86 | **27** | Tu | 5 52 | 6 19 |
| 87 | **28** | W | 5 51 | 6 20 |
| 88 | **29** | Th | 5 49 | 6 21 |
| 89 | **30** | F | 5 47 | 6 22 |
| 90 | **31** | Sa | 5 45 | 6 23 |

## April, 1906.

### 4th Month. 30 Days.

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. | |
|---|---|---|---|---|
| | | | Sun rises. | Sun sets. |
| | | | H. M | H. M |
| 91 | **1** | 𝕾 | 5 44 | 6 24 |
| 92 | **2** | M | 5 42 | 6 26 |
| 93 | **3** | Tu | 5 41 | 6 27 |
| 94 | **4** | W | 5 39 | 6 28 |
| 95 | **5** | Th | 5 37 | 6 29 |
| 96 | **6** | F | 5 36 | 6 30 |
| 97 | **7** | Sa | 5 34 | 6 31 |
| 98 | **8** | 𝕾 | 5 33 | 6 32 |
| 99 | **9** | M | 5 31 | 6 33 |
| 100 | **10** | Tu | 5 30 | 6 34 |
| 101 | **11** | W | 5 28 | 6 35 |
| 102 | **12** | Th | 5 26 | 6 36 |
| 103 | **13** | F | 5 25 | 6 37 |
| 104 | **14** | Sa | 5 24 | 6 38 |
| 105 | **15** | 𝕾 | 5 22 | 6 39 |
| 106 | **16** | M | 5 20 | 6 40 |
| 107 | **17** | Tu | 5 19 | 6 41 |
| 108 | **18** | W | 5 17 | 6 42 |
| 109 | **19** | Th | 5 16 | 6 43 |
| 110 | **20** | F | 5 14 | 6 44 |
| 111 | **21** | Sa | 5 13 | 6 45 |
| 112 | **22** | 𝕾 | 5 11 | 6 46 |
| 113 | **23** | M | 5 10 | 6 47 |
| 114 | **24** | Tu | 5 08 | 6 48 |
| 115 | **25** | W | 5 07 | 6 49 |
| 116 | **26** | Th | 5 06 | 6 50 |
| 117 | **27** | F | 5 04 | 6 51 |
| 118 | **28** | Sa | 5 03 | 6 52 |
| 119 | **29** | 𝕾 | 5 02 | 6 53 |
| 120 | **30** | M | 5 00 | 6 55 |

## May, 1906.

5th Month. 31 Days.

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. | |
|---|---|---|---|---|
| | | | Sun rises. H. M | Sun sets. H. M. |
| 121 | **1** | Tu | 4 59 | 6 56 |
| 122 | **2** | W | 4 58 | 6 57 |
| 123 | **3** | Th | 4 56 | 6 58 |
| 124 | **4** | F | 4 55 | 6 59 |
| 125 | **5** | Sa | 4 54 | 7 00 |
| 126 | **6** | S | 4 53 | 7 01 |
| 127 | **7** | M | 4 52 | 7 02 |
| 128 | **8** | Tu | 4 51 | 7 03 |
| 129 | **9** | W | 4 49 | 7 04 |
| 130 | **10** | Th | 4 48 | 7 05 |
| 131 | **11** | F | 4 47 | 7 06 |
| 132 | **12** | Sa | 4 46 | 7 07 |
| 133 | **13** | S | 4 45 | 7 08 |
| 134 | **14** | M | 4 44 | 7 09 |
| 135 | **15** | Tu | 4 43 | 7 10 |
| 136 | **16** | W | 4 42 | 7 11 |
| 137 | **17** | Th | 4 41 | 7 12 |
| 138 | **18** | F | 4 40 | 7 13 |
| 139 | **19** | Sa | 4 39 | 7 14 |
| 140 | **20** | S | 4 39 | 7 15 |
| 141 | **21** | M | 4 38 | 7 16 |
| 142 | **22** | Tu | 4 37 | 7 17 |
| 143 | **23** | W | 4 36 | 7 18 |
| 144 | **24** | Th | 4 36 | 7 19 |
| 145 | **25** | F | 4 35 | 7 20 |
| 146 | **26** | Sa | 4 34 | 7 20 |
| 147 | **27** | S | 4 34 | 7 21 |
| 148 | **28** | M | 4 33 | 7 22 |
| 149 | **29** | Tu | 4 32 | 7 23 |
| 150 | **30** | W | 4 32 | 7 23 |
| 151 | **31** | Th | 4 31 | 7 24 |

## June, 1906.

6th Month. 30 Days.

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. | |
|---|---|---|---|---|
| | | | Sun rises. H. M. | Sun sets. H. M |
| 152 | **1** | F | 4 31 | 7 24 |
| 153 | **2** | Sa | 4 30 | 7 25 |
| 154 | **3** | S | 4 30 | 7 26 |
| 155 | **4** | M | 4 30 | 7 26 |
| 156 | **5** | Tu | 4 29 | 7 27 |
| 157 | **6** | W | 4 29 | 7 28 |
| 158 | **7** | Th | 4 29 | 7 28 |
| 159 | **8** | F | 4 29 | 7 29 |
| 160 | **9** | Sa | 4 28 | 7 30 |
| 161 | **10** | S | 4 28 | 7 30 |
| 162 | **11** | M | 4 28 | 7 31 |
| 163 | **12** | Tu | 4 28 | 7 31 |
| 164 | **13** | W | 4 28 | 7 32 |
| 165 | **14** | Th | 4 28 | 7 32 |
| 166 | **15** | F | 4 28 | 7 32 |
| 167 | **16** | Sa | 4 28 | 7 33 |
| 168 | **17** | S | 4 28 | 7 33 |
| 169 | **18** | M | 4 28 | 7 33 |
| 170 | **19** | Tu | 4 28 | 7 34 |
| 171 | **20** | W | 4 29 | 7 34 |
| 172 | **21** | Th | 4 29 | 7 34 |
| 173 | **22** | F | 4 29 | 7 34 |
| 174 | **23** | Sa | 4 29 | 7 34 |
| 175 | **24** | S | 4 29 | 7 34 |
| 176 | **25** | M | 4 30 | 7 35 |
| 177 | **26** | Tu | 4 30 | 7 35 |
| 178 | **27** | W | 4 30 | 7 35 |
| 179 | **28** | Th | 4 31 | 7 35 |
| 180 | **29** | F | 4 31 | 7 35 |
| 181 | **30** | Sa | 4 32 | 7 35 |

## July, 1906.

**7th Month. 31 Days.**

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. |  |
|---|---|---|---|---|
|  |  |  | Sun rises. | Sun sets. |
|  |  |  | H. M | H. M. |
| 182 | **1** | 𝔖 | 4 32 | 7 35 |
| 183 | **2** | M | 4 32 | 7 35 |
| 184 | **3** | Tu | 4 33 | 7 34 |
| 185 | **4** | W | 4 33 | 7 34 |
| 186 | **5** | Th | 4 34 | 7 34 |
| 187 | **6** | F | 4 35 | 7 34 |
| 188 | **7** | Sa | 4 35 | 7 33 |
| 189 | **8** | 𝔖 | 4 36 | 7 33 |
| 190 | **9** | M | 4 37 | 7 33 |
| 191 | **10** | Tu | 4 37 | 7 32 |
| 192 | **11** | W | 4 38 | 7 32 |
| 193 | **12** | Th | 4 39 | 7 31 |
| 194 | **13** | F | 4 39 | 7 31 |
| 195 | **14** | Sa | 4 40 | 7 30 |
| 196 | **15** | 𝔖 | 4 41 | 7 30 |
| 197 | **16** | M | 4 42 | 7 29 |
| 198 | **17** | Tu | 4 43 | 7 29 |
| 199 | **18** | W | 4 44 | 7 28 |
| 200 | **19** | Th | 4 44 | 7 27 |
| 201 | **20** | F | 4 45 | 7 26 |
| 202 | **21** | Sa | 4 46 | 7 26 |
| 203 | **22** | 𝔖 | 4 47 | 7 25 |
| 204 | **23** | M | 4 48 | 7 24 |
| 205 | **24** | Tu | 4 48 | 7 23 |
| 206 | **25** | W | 4 49 | 7 23 |
| 207 | **26** | Th | 4 50 | 7 22 |
| 208 | **27** | F | 4 51 | 7 21 |
| 209 | **28** | Sa | 4 52 | 7 20 |
| 210 | **29** | 𝔖 | 4 53 | 7 19 |
| 211 | **30** | M | 4 54 | 7 18 |
| 212 | **31** | Tu | 4 55 | 7 17 |

## August, 1906.

**8th Month. 31 Days.**

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. |  |
|---|---|---|---|---|
|  |  |  | Sun rises. | Sun sets. |
|  |  |  | H. M | H. M |
| 213 | **1** | W | 4 56 | 7 16 |
| 214 | **2** | Th | 4 57 | 7 14 |
| 215 | **3** | F | 4 58 | 7 13 |
| 216 | **4** | Sa | 4 59 | 7 12 |
| 217 | **5** | 𝔖 | 5 00 | 7 11 |
| 218 | **6** | M | 5 01 | 7 10 |
| 219 | **7** | Tu | 5 02 | 7 09 |
| 220 | **8** | W | 5 03 | 7 07 |
| 221 | **9** | Th | 5 04 | 7 06 |
| 222 | **10** | F | 5 05 | 7 05 |
| 223 | **11** | Sa | 5 06 | 7 04 |
| 224 | **12** | 𝔖 | 5 07 | 7 02 |
| 225 | **13** | M | 5 08 | 7 01 |
| 226 | **14** | Tu | 5 09 | 7 00 |
| 227 | **15** | W | 5 10 | 6 58 |
| 228 | **16** | Th | 5 11 | 6 57 |
| 229 | **17** | F | 5 12 | 6 55 |
| 230 | **18** | Sa | 5 13 | 6 54 |
| 231 | **19** | 𝔖 | 5 14 | 6 53 |
| 232 | **20** | M | 5 15 | 6 51 |
| 233 | **21** | Tu | 5 16 | 6 50 |
| 234 | **22** | W | 5 16 | 6 48 |
| 235 | **23** | Th | 5 17 | 6 47 |
| 236 | **24** | F | 5 18 | 6 45 |
| 237 | **25** | Sa | 5 19 | 6 44 |
| 238 | **26** | 𝔖 | 5 20 | 6 42 |
| 239 | **27** | M | 5 21 | 6 41 |
| 240 | **28** | Tu | 5 22 | 6 39 |
| 241 | **29** | W | 5 23 | 6 37 |
| 242 | **30** | Th | 5 24 | 6 36 |
| 243 | **31** | F | 5 25 | 6 34 |

## September, 1906.

**9th Month. 30 Days.**

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. Sun rises. H. M | N. Y. City. Sun sets. H. M. |
|---|---|---|---|---|
| 244 | **1** | Sa | 5 26 | 6 33 |
| 245 | **2** | 𝔖 | 5 27 | 6 31 |
| 246 | **3** | M | 5 28 | 6 29 |
| 247 | **4** | Tu | 5 29 | 6 28 |
| 248 | **5** | W | 5 30 | 6 26 |
| 249 | **6** | Th | 5 31 | 6 25 |
| 250 | **7** | F | 5 32 | 6 23 |
| 251 | **8** | Sa | 5 33 | 6 21 |
| 252 | **9** | 𝔖 | 5 34 | 6 20 |
| 253 | **10** | M | 5 35 | 6 18 |
| 254 | **11** | Tu | 5 36 | 6 16 |
| 255 | **12** | W | 5 37 | 6 15 |
| 256 | **13** | Th | 5 38 | 6 13 |
| 257 | **14** | F | 5 39 | 6 11 |
| 258 | **15** | Sa | 5 40 | 6 09 |
| 259 | **16** | 𝔖 | 5 41 | 6 08 |
| 260 | **17** | M | 5 42 | 6 06 |
| 261 | **18** | Tu | 5 43 | 6 04 |
| 262 | **19** | W | 5 44 | 6 03 |
| 263 | **20** | Th | 5 45 | 6 01 |
| 264 | **21** | F | 5 46 | 5 59 |
| 265 | **22** | Sa | 5 47 | 5 58 |
| 266 | **23** | 𝔖 | 5 48 | 5 56 |
| 267 | **24** | M | 5 49 | 5 55 |
| 268 | **25** | Tu | 5 50 | 5 53 |
| 269 | **26** | W | 5 51 | 5 52 |
| 270 | **27** | Th | 5 52 | 5 50 |
| 271 | **28** | F | 5 53 | 5 48 |
| 272 | **29** | Sa | 5 54 | 5 46 |
| 273 | **30** | 𝔖 | 5 54 | 5 44 |

## October, 1906.

**10th Month. 31 Days.**

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. Sun rises. H. M. | N. Y. City. Sun sets. H. M |
|---|---|---|---|---|
| 274 | **1** | M | 5 56 | 5 43 |
| 275 | **2** | Tu | 5 57 | 5 41 |
| 276 | **3** | W | 5 58 | 5 39 |
| 277 | **4** | Th | 5 59 | 5 38 |
| 278 | **5** | F | 6 00 | 5 36 |
| 279 | **6** | Sa | 6 01 | 5 35 |
| 280 | **7** | 𝔖 | 6 02 | 5 33 |
| 281 | **8** | M | 6 03 | 5 31 |
| 282 | **9** | Tu | 6 04 | 5 30 |
| 283 | **10** | W | 6 05 | 5 28 |
| 284 | **11** | Th | 6 07 | 5 27 |
| 285 | **12** | F | 6 08 | 5 25 |
| 286 | **13** | Sa | 6 09 | 5 23 |
| 287 | **14** | 𝔖 | 6 10 | 5 22 |
| 288 | **15** | M | 6 11 | 5 20 |
| 289 | **16** | Tu | 6 12 | 5 19 |
| 290 | **17** | W | 6 13 | 5 17 |
| 291 | **18** | Th | 6 14 | 5 16 |
| 292 | **19** | F | 6 15 | 5 14 |
| 293 | **20** | Sa | 6 16 | 5 13 |
| 294 | **21** | 𝔖 | 6 18 | 5 12 |
| 295 | **22** | M | 6 19 | 5 10 |
| 296 | **23** | Tu | 6 20 | 5 09 |
| 297 | **24** | W | 6 21 | 5 07 |
| 298 | **25** | Th | 6 22 | 5 06 |
| 299 | **26** | F | 6 23 | 5 04 |
| 300 | **27** | Sa | 6 24 | 5 03 |
| 301 | **28** | 𝔖 | 6 26 | 5 02 |
| 302 | **29** | M | 6 27 | 5 01 |
| 303 | **30** | Tu | 6 28 | 4 59 |
| 304 | **31** | W | 6 29 | 4 58 |

## November, 1906.

### 11th Month. 30 Days.

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. | |
|---|---|---|---|---|
| | | | Sun rises. | Sun sets. |
| | | | H. M | H. M. |
| 305 | **1** | Th | 6 30 | 4 57 |
| 306 | **2** | F | 6 31 | 4 56 |
| 307 | **3** | Sa | 6 32 | 4 54 |
| 308 | **4** | 𝔖 | 6 34 | 4 53 |
| 309 | **5** | M | 6 35 | 4 52 |
| 310 | **6** | Tu | 6 36 | 4 51 |
| 311 | **7** | W | 6 37 | 4 50 |
| 312 | **8** | Th | 6 38 | 4 49 |
| 313 | **9** | F | 6 40 | 4 48 |
| 314 | **10** | Sa | 6 41 | 4 47 |
| 315 | **11** | 𝔖 | 6 42 | 4 46 |
| 316 | **12** | M | 6 43 | 4 45 |
| 317 | **13** | Tu | 6 44 | 4 44 |
| 318 | **14** | W | 6 46 | 4 43 |
| 319 | **15** | Th | 6 47 | 4 42 |
| 320 | **16** | F | 6 48 | 4 41 |
| 321 | **17** | Sa | 6 49 | 4 40 |
| 322 | **18** | 𝔖 | 6 50 | 4 39 |
| 323 | **19** | M | 6 51 | 4 39 |
| 324 | **20** | Tu | 6 53 | 4 38 |
| 325 | **21** | W | 6 54 | 4 38 |
| 326 | **22** | Th | 6 55 | 4 37 |
| 327 | **23** | F | 6 56 | 4 36 |
| 328 | **24** | Sa | 6 57 | 4 36 |
| 329 | **25** | 𝔖 | 6 58 | 4 35 |
| 330 | **26** | M | 6 59 | 4 35 |
| 331 | **27** | Tu | 7 00 | 4 35 |
| 332 | **28** | W | 7 02 | 4 34 |
| 333 | **29** | Th | 7 03 | 4 34 |
| 334 | **30** | F | 7 04 | 4 34 |

## December, 1906.

### 12th Month. 31 Days.

| Day of Year. | Day of Month. | Day of Week. | N. Y. City. | |
|---|---|---|---|---|
| | | | Sun rises. | Sun sets. |
| | | | H. M | H. M |
| 335 | **1** | Sa | 7 05 | 4 34 |
| 336 | **2** | 𝔖 | 7 06 | 4 33 |
| 337 | **3** | M | 7 07 | 4 33 |
| 338 | **4** | Tu | 7 08 | 4 33 |
| 339 | **5** | W | 7 09 | 4 32 |
| 340 | **6** | Th | 7 10 | 4 32 |
| 341 | **7** | F | 7 11 | 4 32 |
| 342 | **8** | Sa | 7 12 | 4 32 |
| 343 | **9** | 𝔖 | 7 13 | 4 32 |
| 344 | **10** | M | 7 14 | 4 32 |
| 345 | **11** | Tu | 7 15 | 4 32 |
| 346 | **12** | W | 7 15 | 4 32 |
| 347 | **13** | Th | 7 16 | 4 33 |
| 348 | **14** | F | 7 16 | 4 33 |
| 349 | **15** | Sa | 7 17 | 4 33 |
| 350 | **16** | 𝔖 | 7 18 | 4 33 |
| 351 | **17** | M | 7 18 | 4 33 |
| 352 | **18** | Tu | 7 19 | 4 34 |
| 353 | **19** | W | 7 20 | 4 34 |
| 354 | **20** | Th | 7 20 | 4 35 |
| 355 | **21** | F | 7 21 | 4 35 |
| 356 | **22** | Sa | 7 21 | 4 36 |
| 357 | **23** | 𝔖 | 7 22 | 4 37 |
| 358 | **24** | M | 7 22 | 4 37 |
| 359 | **25** | Tu | 7 23 | 4 38 |
| 360 | **26** | W | 7 23 | 4 39 |
| 361 | **27** | Th | 7 23 | 4 39 |
| 362 | **28** | F | 7 23 | 4 40 |
| 363 | **29** | Sa | 7 24 | 4 40 |
| 364 | **30** | 𝔖 | 7 24 | 4 41 |
| 365 | **31** | M | 7 24 | 4 42 |

# Reference Calendar for Three Years.

## 1905

| | S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|---|
| **Jan.** | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | 31 | .. | .. | .. | .. |
| **Feb.** | .. | .. | .. | 1 | 2 | 3 | 4 |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | 26 | 27 | 28 | .. | .. | .. | .. |
| **Mar.** | .. | .. | .. | 1 | 2 | 3 | 4 |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | 26 | 27 | 28 | 29 | 30 | 31 | .. |
| **April** | .. | .. | .. | .. | .. | .. | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | .. | .. | .. | .. | .. | .. |

| | S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|---|
| **May** | .. | 1 | 2 | 3 | 4 | 5 | 6 |
| | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| | 28 | 29 | 30 | 31 | .. | .. | .. |
| **June** | .. | .. | .. | .. | 1 | 2 | 3 |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | 25 | 26 | 27 | 28 | 29 | 30 | .. |
| **July** | .. | .. | .. | .. | .. | .. | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | 31 | .. | .. | .. | .. | .. |
| **Aug.** | .. | .. | 1 | 2 | 3 | 4 | 5 |
| | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | 27 | 28 | 29 | 30 | 31 | .. | .. |

| | S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|---|
| **Sept.** | .. | .. | .. | .. | .. | 1 | 2 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | .. | .. | .. | .. | .. | .. | .. |
| **Oct.** | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | 31 | .. | .. | .. | .. |
| **Nov.** | .. | .. | .. | 1 | 2 | 3 | 4 |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | 26 | 27 | 28 | 29 | 30 | .. | .. |
| **Dec.** | .. | .. | .. | .. | .. | 1 | 2 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | 31 | .. | .. | .. | .. | .. | .. |

## 1906

| | S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|---|
| **Jan.** | .. | 1 | 2 | 3 | 4 | 5 | 6 |
| | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| | 28 | 29 | 30 | 31 | .. | .. | .. |
| **Feb.** | .. | .. | .. | .. | 1 | 2 | 3 |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | 25 | 26 | 27 | 28 | .. | .. | .. |
| **Mar.** | .. | .. | .. | .. | 1 | 2 | 3 |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | 25 | 26 | 27 | 28 | 29 | 30 | 31 |
| | .. | .. | .. | .. | .. | .. | .. |
| **April** | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | .. | .. | .. | .. | .. |

| | S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|---|
| **May** | .. | .. | 1 | 2 | 3 | 4 | 5 |
| | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | 27 | 28 | 29 | 30 | 31 | .. | .. |
| **June** | .. | .. | .. | .. | .. | 1 | 2 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | .. | .. | .. | .. | .. | .. | .. |
| **July** | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | 31 | .. | .. | .. | .. |
| **Aug.** | .. | .. | .. | 1 | 2 | 3 | 4 |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | 26 | 27 | 28 | 29 | 30 | 31 | .. |

| | S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|---|
| **Sept.** | .. | .. | .. | .. | .. | .. | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | .. | .. | .. | .. | .. | .. |
| **Oct.** | .. | 1 | 2 | 3 | 4 | 5 | 6 |
| | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| | 28 | 29 | 30 | 31 | .. | .. | .. |
| **Nov.** | .. | .. | .. | .. | 1 | 2 | 3 |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | 25 | 26 | 27 | 28 | 29 | 30 | .. |
| **Dec.** | .. | .. | .. | .. | .. | .. | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | 31 | .. | .. | .. | .. | .. |

## 1907

| | S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|---|
| **Jan.** | .. | .. | 1 | 2 | 3 | 4 | 5 |
| | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | 27 | 28 | 29 | 30 | 31 | .. | .. |
| **Feb.** | .. | .. | .. | .. | .. | 1 | 2 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | 24 | 25 | 26 | 27 | 28 | .. | .. |
| **Mar.** | .. | .. | .. | .. | .. | 1 | 2 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | 31 | .. | .. | .. | .. | .. | .. |
| **April** | .. | 1 | 2 | 3 | 4 | 5 | 6 |
| | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| | 28 | 29 | 30 | .. | .. | .. | .. |

| | S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|---|
| **May** | .. | .. | .. | 1 | 2 | 3 | 4 |
| | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| | 26 | 27 | 28 | 29 | 30 | 31 | .. |
| **June** | .. | .. | .. | .. | .. | .. | 1 |
| | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| | 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| | 30 | | | | | | |
| **July** | .. | 1 | 2 | 3 | 4 | 5 | 6 |
| | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
| | 28 | 29 | 30 | 31 | .. | .. | .. |
| **Aug.** | .. | .. | .. | .. | 1 | 2 | 3 |
| | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| | 25 | 26 | 27 | 28 | 29 | 30 | 31 |

| | S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|---|
| **Sept.** | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | .. | .. | .. | .. | .. |
| **Oct.** | .. | .. | 1 | 2 | 3 | 4 | 5 |
| | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| | 27 | 28 | 29 | 30 | 31 | .. | .. |
| **Nov.** | .. | .. | .. | .. | .. | 1 | 2 |
| | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| | 17 | 18 | 19 | 20 | 21 | 22 | 23 |
| | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| | .. | .. | .. | .. | .. | .. | .. |
| **Dec.** | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| | 29 | 30 | 31 | .. | .. | .. | .. |

## Eclipses in 1906.

NOTE.—*Local mean time for the latitude of New York City is used in reckoning eclipses, sunset and sunrise. Subtract four minutes to change the reckoning to Eastern standard time of 75th meridian.*

*Moon's phases are calculated for Eastern standard time. "Morn," is understood to extend from Midnight to Noon; "Eve," from Noon to Midnight.*

In the year 1906 there will be five Eclipses, three of the Sun and two of the Moon, as follows:

I. Total of the Moon, February 9. Begins, 0.57 A.M.; total begins, 1.58 A.M.; middle, 2.47 A.M.; total ends, 3.36 A.M., ends, 4.37 A.M.

II. Partial of the Sun, February 23, invisible.

III. Partial of the Sun, July 21, invisible.

IV. Total of the Moon, August 4. The beginning only will be visible in western U. S.

V. Partial of the Sun, August 19, visible in northwestern U. S., Wyoming, Montana, Idaho, Washington and Oregon.

## The Seasons.

| | | | |
|---|---|---|---|
| SPRING begins | March 20, 3 p.m. | AUTUMN begins | September 23, 2 a.m. |
| SUMMER begins | June 21, noon. | WINTER begins | December 21, 9 p.m. |

## Church Days.

| | | | |
|---|---|---|---|
| Septuagesima Sun. | Feb. 11 | Good Friday | Apr. 13 |
| Sexagesima Sun. | Feb. 18 | Easter Sunday | Apr. 15 |
| Quinquagesima Sun | Feb. 25 | Low Sunday | Apr. 22 |
| Shrove Tuesday | Feb. 27 | Rogation Sunday | May 20 |
| Ash Wednesday | Feb. 28 | Ascension Day | May 24 |
| Quadragesima Sun. | Mar. 4 | Whitsunday (Pent.) | June 3 |
| Mid-Lent Sun. | Mar. 25 | Trinity Sunday | June 10 |
| Passion Sun. | Apr. 1 | Corpus Christi | June 14 |
| Palm Sunday | Apr. 8 | Advent Sunday | Dec. 2 |

## Chronological Cycles.

| | |
|---|---|
| Dominical Letter | G |
| Epact | 5 |
| Lunar Cycle (Gold. No.) | 7 |
| Solar Cycle | 11 |
| Roman Indiction | 4 |
| Julian Period | 6619 |
| Dionysian Period | 235 |
| Jewish Lunar Cycle | 4 |

## Chronological Eras.

The year 1906, which comprises the latter part of the 130th and the first part of the 131st year of the INDEPENDENCE OF THE UNITED STATES OF AMERICA, corresponds to the year 6619 of the JULIAN PERIOD the year 7414-7415 of the BYZANTINE ERA; the year 5666-67 of the JEWISH ERA; the year 2659 since the FOUNDATION OF ROME, according to Varro; the year 2682 of the OLYMPIADS; the year 1622 of the era of DIOCLETIAN; the year 2566 of the JAPANESE ERA; the year 1323-24 of the MOHAMMEDAN ERA.

The 1st day of January of the year 1906 is the 2,417,212th day since the commencement of the JULIAN PERIOD.

The JULIAN CALENDAR, which is still used in the Russian Empire, dates twelve days back of our own—the GREGORIAN CALENDAR. Thus a letter from St. Petersburg dated January 1st was really written on January 13th.

The Russians generally use, in official documents and frequently in business correspondence, two dates, which they call "old style" and "new style"; and in Alaska three dates have been used on their documents, because the early navigators forgot to make allowance for the crossing of the 180th meridian in sailing from Siberia to North America.

## Legal Holidays in the Various States.

JAN. 1. NEW YEAR'S DAY: In all States except Massachusetts, New Hampshire and Rhode Island.

JAN. 8. ANNIVERSARY OF THE BATTLE OF NEW ORLEANS: In Louisiana.

JAN. 19. LEE'S BIRTHDAY: In Georgia, North Carolina and Virginia.

FEB. 12. LINCOLN'S BIRTHDAY: In all States.

FEB. 22. WASHINGTON'S BIRTHDAY: In all States except Arkansas, Iowa and Mississippi

FEB. 19 MARDI-GRAS: In Alabama and Louisiana

MARCH 2. ANNIVERSARY OF TEXAN INDEPENDENCE: In Texas.

MARCH 4. FIREMEN'S ANNIVERSARY: In New Orleans, La.

APRIL 1. GOOD FRIDAY: In Alabama, Louisiana, Maryland, Pennsylvania and Tennessee

APRIL 19. PATRIOTS' DAY: In Massachusetts.

APRIL 21. ANNIVERSARY OF THE BATTLE OF SAN JACINTO: In Texas.

APRIL 26. MEMORIAL DAY: In Alabama and Georgia.

MAY 4. CHARTER DAY: In New York City.

MAY 10. MEMORIAL DAY: In North Carolina.

MAY 20. ANNIVERSARY OF THE SIGNING OF THE MECKLENBURG DECLARATION OF INDEPENDENCE: In North Carolina.

MAY 30. DECORATION DAY: In Arizona, California, Colorado, Connecticut, Delaware, District of Columbia, Iowa, Illinois, Indiana, Kansas, Maine, Maryland, Massachusetts, Michigan, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, Tennessee, Utah, Vermont, Wisconsin, Washington and Wyoming.

JUNE 3. JEFFERSON DAVIS'S BIRTHDAY: In Florida.

JUNE 17. BATTLE OF BUNKER HILL: In Boston, Mass.

JULY 4. INDEPENDENCE DAY: In all States.

JULY 24. PIONEERS' DAY: In Utah.

SEPT. 3. LABOR DAY: In Alabama, California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kansas, Maine, Maryland, Massachusetts, Michigan, Montana, Nebraska, New Hampshire, New Jersey, New York,

## Legal Holidays (Continued).

Ohio, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia and Washington.

SEPT. 9. ADMISSION DAY: In California.

SEPT. 12. LABOR DAY: In Florida.

OCT. 31. ADMISSION DAY: In Nevada.

NOV 8. GENERAL ELECTION DAY: In Arizona, California, Idaho, Indiana, Kansas, Maryland, Minnesota, Missouri, Montana, Nevada, New Hampshire, New Jerse , New York, North Dakota, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, West Virginia, Washington, Wisconsin and Wyoming.

NOV. 25 LABOR DAY: In Louisiana.

NOV. 29. THANKSGIVING DAY: In all States, though in some it is not a statutory holiday

DEC. 25 CHRISTMAS DAY. In all States; in South Carolina, the two succeeding days in addition.

SUNDAYS AND FAST DAYS are legal holidays in all States, which designate them as such

ARBOR DAY is a legal holiday in Kansas, North Dakota, Rhode Island and Wyoming, the day being set by the Governor—In Nebraska, April 22; California, September 9; Colorado, third Friday in April; Montana, third Tuesday in April; Utah, first Saturday in April: Idaho, Friday after May 1.

EVERY SATURDAY after 12 o'clock noon is a legal holiday in New York, New Jersey, New Orleans, Pennsylvania and Maryland; and from June 1 to September 30 in New Castle Co., Del.

THERE are no national holidays, not even the Fourth of July. Congress has at various times appointed special holidays. In the second session of the Fifty-third Congress, it passed an act making Labor Day a public holiday in the District of Columbia; and it has recognized the existence of certain days as holidays, for commercial purposes, in such legislation as the Bankruptcy act, but with the exception named, there is no general statute on the subject. The proclamation of the President designating a day of thanksgiving only, makes it a holiday in those States which provide by law for it.

---

## United States and Territories.

| States and Territories. | Populat'n in 1900. | Capitals. | States and Territories. | Populat'n in 1900. | Capitals. |
|---|---|---|---|---|---|
| Alabama | 1,828,697 | Montgomery. | Montana | 243,329 | Helena. |
| Alaska Terr | 63,441 | Sitka. | Nebraska | 1,068,539 | Lincoln. |
| Arizona Terr | 122,9 1 | Phœnix. | Nevada | 42,335 | Carson City. |
| Arkansas | 1,311,564 | Little Rock | New Hampshire. | 411,588 | Concord. |
| California | 1,485,053 | Sacramento. | New Jersey | 1,883,669 | Trenton. |
| Colorado | 539,700 | Denver. | New Mexico T. | 195,310 | Santa Fé. |
| Connecticut | 908,355 | Hartford. | New York | 7,268,012 | Albany. |
| Delaware | 184,735 | Dover. | North Carolina. | 1,893,810 | Raleigh. |
| Florida | 528,542 | Tallahassee. | North Dakota | 319,146 | Bismark. |
| Georgia | 2,216,331 | Atlanta. | Ohio | 4,157,545 | Columbus. |
| Idaho | 161,772 | Boise City. | Oklahoma Terr. | 398,245 | Guthrie. |
| Illinois | 4,821,550 | Springfield. | Oregon | 413,536 | Salem |
| Indiana | 2,516,462 | Indianapolis. | Pennsylvania | 6,302,115 | Harrisburg. |
| Indian Terr | 391,960 |  | Rhode Island | 428,556 | Providence. |
| Iowa | 2,231,853 | Des Moines | South Carolina. | 1,340,316 | Columbia. |
| Kansas | 1,470,495 | Topeka. | South Dakota | 401,570 | Pierre. |
| Kentucky | 2,147,174 | Frankfort. | Tennessee | 2,020,616 | Nashville. |
| Louisiana | 1,381,625 | Baton Rouge. | Texas | 3,048,710 | Austin. |
| Maine | 694,466 | Augusta. | Utah Terr | 276,749 | Salt Lake City. |
| Maryland | 1 190,050 | Annapolis. | Vermont | 343,641 | Montpelier. |
| Massachusetts | 2,805,346 | Boston. | Virginia | 1,854 184 | Richmond. |
| Michigan | 2,420,982 | Lansing. | Washington | 518,103 | Olympia. |
| Minnesota | 1,751,394 | St. Paul. | West Virginia | 958,800 | Charleston. |
| Mississippi | 1,551,270 | Jackson. | Wisconsin | 2,069,042 | Madison. |
| Missouri | 3,106,665 | Jefferson City. | Wyoming | 92,531 | Cheyenne. |

## Difference in Time (for Cable Purposes).

BETWEEN THE CITY OF NEW YORK AND THE PRINCIPAL FOREIGN CITIES.

| LATER THAN NEW YORK. |  |  |  |  |  | EARLIER THAN NEW YORK. |  |
|---|---|---|---|---|---|---|---|
|  | H. M. |  | H. M |  | H. M. |  | H. M. |
| Antwerp | 5 13.5 | Dublin | 4 30.5 | Rio de Janeiro. | 2 3.2 | Havana | 0 33.5 |
| Berlin | 5 49.5 | Edinburgh | 4 43.2 | Rome | 5 45.8 | Hong Kong | 11 27.4 |
| Bremen | 5 31.0 | Geneva | 5 20.5 | St. Petersburg | 6 57.1 | Melbourne | 9 24.2 |
| Brussels | 5 13.4 | Hamburg | 5 35.8 | Valparaiso | 0 9.3 | Mexico City of | 1 40.5 |
| Buenos Ayres | 1 2.4 | Liverpool | 4 43.6 | Vienna | 6 1.2 | Panama | 0 22.2 |
| Calcutta | 11 49.2 | London | 4 55.9 | Halifax | 0 41.5 | Yokohama | 9 45.5 |
| Constantinople | 6 51.9 | Madrid | 4 41.1 |  |  |  |  |
|  |  | Paris | 5 5.2 |  |  |  |  |

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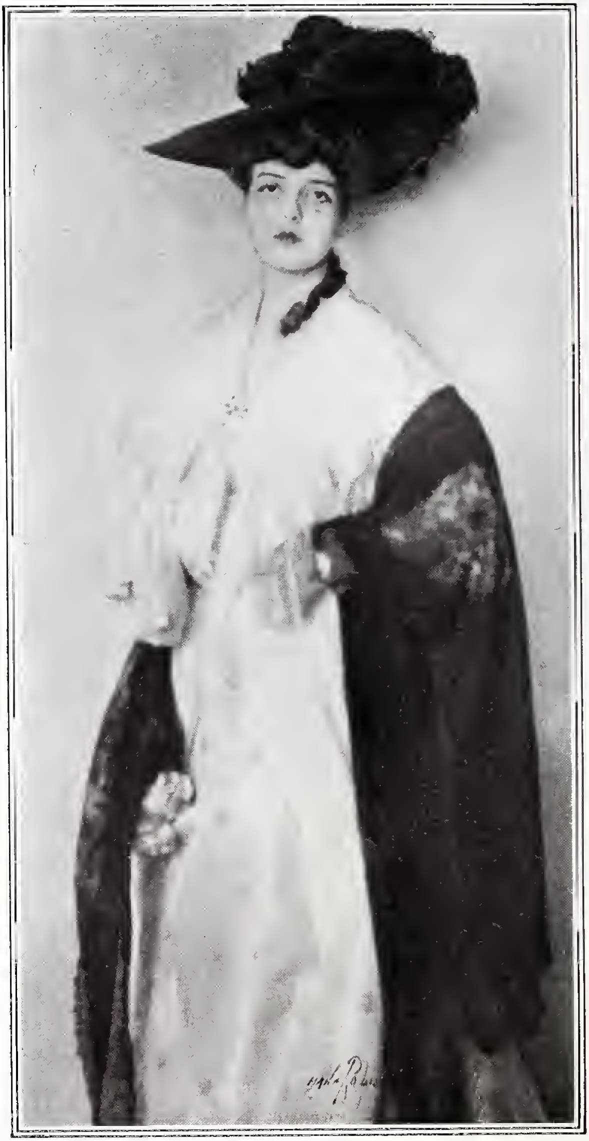


**DEAR LADY DISDAIN**

**Hana Robinson**

# The American Annual of Photography for 1906

ROBERTA. ALEX. J. RUMMLER.

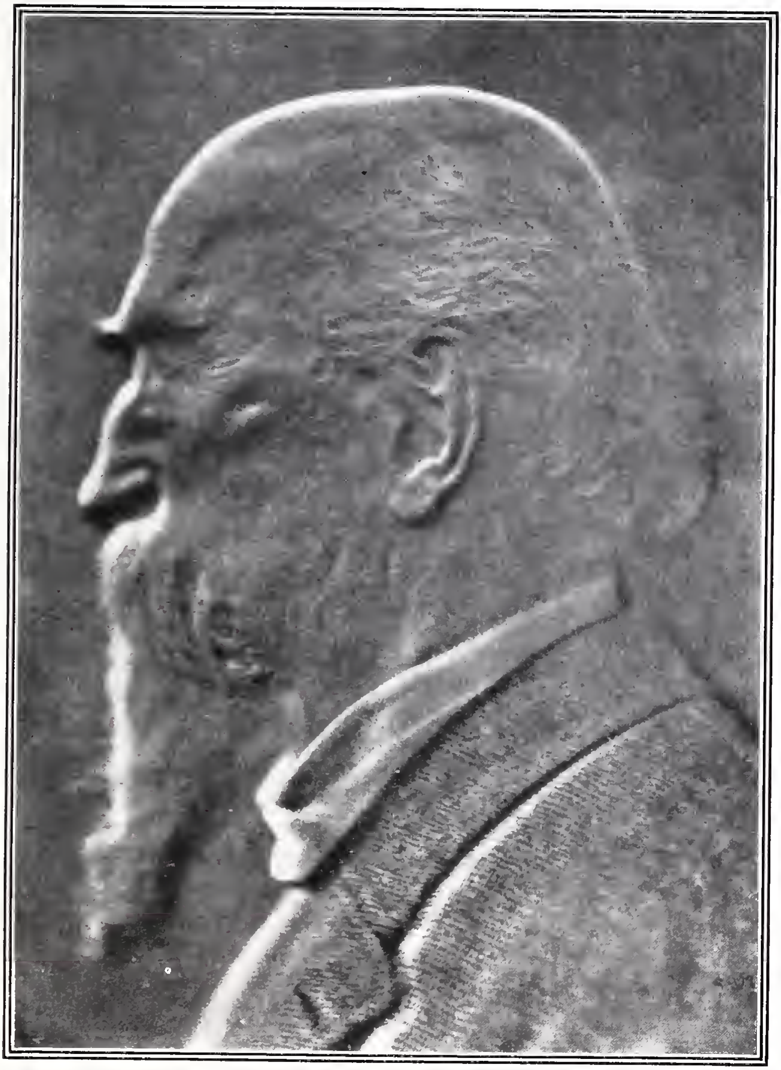
# Cameo Relief Printing. A Brief Report of a Few Experiments.

*By Dr. F. Detlefsen.*

MY experiments were suggested to me through the reading of a reprint from last year's Amateur Photographer (British), relating to a method of producing prints having the effect of cameo reliefs. The article referred to briefly outlines the methods of Mr. Vivian Yeo and Mr. J. W. Gordon, who simultaneously made the same discovery, as follows: "Mr. Gordon's idea consists in superimposing a positive transparency upon the negative from which it was printed, and then printing through the two of them simultaneously. To produce the singularly interesting cameo-like effect noticeable in the illustrations, the two plates are placed slightly out of register. Mr. Gordon places his plates film to film, and prints through them on to bromide paper by the aid of an enlarging lantern. Mr. Yeo advocates a mode of working with them glass to glass, which is doubtless convenient for contact printing when both components are on glass; but Mr. Gordon has not as yet tried this. His studies have been made either from a film negative or from plates placed film to film—as has already been mentioned—in a lantern."

This being the only article at my command relative to the subject, I started my experiments in the following manner which proved quite successful and far easier of application than the methods of Messrs. Yeo and Gordon:

Instead of using a positive transparency on glass I first printed a positive on platinotype paper from the negative to be used, placed this behind the negative "slightly out of register," and held it in place by a clear glass plate of the

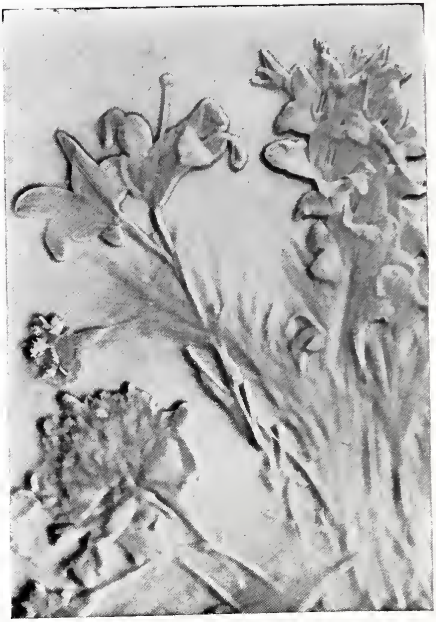


A Veteran Photographer. Dr. F. Detlefsen.

same size. Then the cameo print was made, also on platino type paper in direct sunlight, as it takes about two days to produce one print. Next the print was developed with a developer containing some acetate of potassium, the addition of which produces much contrast—very bright high lights and very dark shadows. The following is one of the many formulæ of the acetate of potassium developer used by me for some years to produce the so-called "Charcoal Prints" that I have shown in exhibitions, and which I also use to develop cameo prints:

Acetate of potassium, citric acid, phosphate of potassium, of each one half ounce. Dissolve in warm water and add: Bichloride of mercury 50 grains, previously dissolved in boiling water. Add enough water to make one pint. Use cold.

A further advantage of this developer is that prints which are far over-printed can still be developed to a fair picture, and, what is more valuable, that it will produce prints from the flattest or the most-underdeveloped negative.



Flower Study. Dr. F. Detlefsen.

The success of my method of cameo relief printing is due to the production of a good transparency on platinotype paper by aid of the acetate of potassium developer and to the contrasty development of the final print with the same developer.

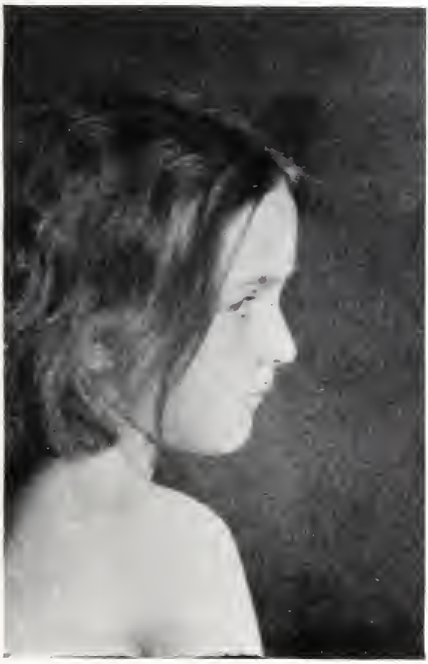
To insure perfect understanding, I may be allowed to summarize briefly:

1.—Put a clear glass plate into the printing frame.

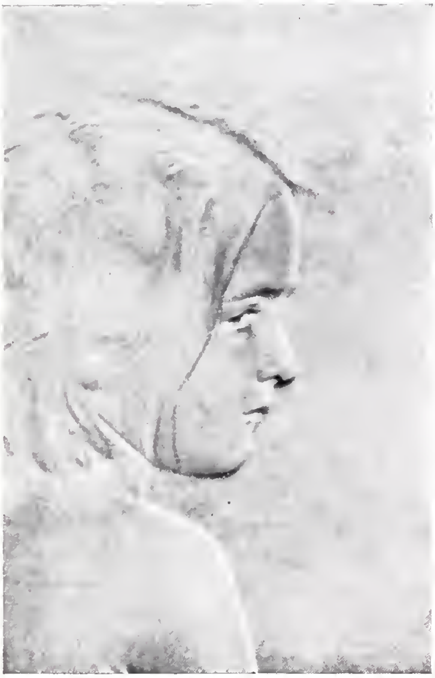
2.—On this place the ordinary print, which you have previously made from the negative, "face out."

3.—On top of this place the negative, "face in." See that print and negative are slightly "out of register."

4.—Next put a sheet of platinotype paper on the negative, film to film with the negative, carefully close your printing frame and you are ready for printing.



ROSETTA. (No. 1) Dr. F. Detlefsen.



ROSETTA. (No. 2) Dr. F. Detlefsen.

5.—Expose to sunlight for two or three days until a fair outline appears; print perhaps less strong than in ordinary platinotype printing.

Of prints reproduced in THE ANNUAL, No. 1 represents the ordinary print and No. 2 the Cameo Relief print made according to my method from the same negative. The remaining ones are other examples.

Through lack of time I have not been able to continue my studies towards a more perfect method of Relief Printing during the past year. I hope, however, that the suggestions contained in the foregoing lines may be of some value to others working in the same field.

A SUN MAID.

George F. Holman.

# Amateur Failures.

**By J. W. Ridpath.**

The Six Brothers.

MANY of the photographic experiences we read remind one of sailors' yarns and fishermen's tales—the narrator always coming out on top, a hero, so to speak. My own experience contains many lamentable failures, in which respect it seems to differ from that of others. The following article will briefly describe a few and suggest the cause in each:

One notable failure occurred on a bright September day about noon. I tried to take a picture of a stone quarry, because the seams in the rock were rather picturesque. The rock itself being principally red, intermixed with dark grey; the seams looked black and contrasted in a minor key with a few weeds which had taken root in the dark yellow earth with which the fissures near the top and sides had been filled by repeated rains. No sooner had I set up my tripod, than the quarrymen, stalwart specimens of the dusky race, at once posed for their pictures. Their faces, arms and hands were a shade darker than the rock, their hats, shoes and overalls were dirty and about the color of the earth, their shirts were equally dark, one being striped green and red. The whole scene struck me as rather picturesque although not brilliant, and to my mind promised a nice, soft negative. Instead of a success it proved a failure. Foreground there was none, the quarry hole occupying that space; colored men against a rocky ledge of nearly the same hue gave no contrast and the green weeds could scarcely be distinguished from the red rocks. My pet view for that trip failed, and great was the fall of my self-confidence. The day, however, was not lost, for the experience taught me that it was hardly fair to expect a camera to furnish light and shade, contrast and artistic effect, where none existed in the scene.

A dazzling golden sunset, with brilliantly illuminated clouds, touched with reds and yellows, beyond the power of painter to imitate, was too great a temptation to resist. It is said the camera cannot lie; where then did it find a sky resembling Bierstead's "Storm on the Rocky Mountains." Instead of brilliant lights I had sombre grays. It was certainly a beautiful sunset, but resulted in a disappointing negative, the yellow and reds were drowned in sombre monochrome.

Wishing to secure a picture of a corn shock, and fearing lest each individual leaf might not be clearly defined, I stopped a good lens down to U. S. 128, and with a fair light, secured not only a clearly defined shock of corn, but also a house, located 2,000 feet away, with each window so sharp that a very slight magnification enables one to count the panes of glass; but atmosphere there was none. To the naked eye there appeared to be foreground, middle distance and dimly defined background. On the negative the distant trees and buildings are brought well to the front, indicating that U. S. 8 would have been better than 128.

A severe snowstorm, accompanied by high wind, closed many of the country roads with deep drifts. When these roads were opened for travel, huge snow-banks, from six to ten feet high, glistened in the sunlight, beautiful and dazzling. Pointing my camera north, at midday, at such a scene, I obtained a negative which yielded a chalky white foreground with a slightly darker sky. The camera refused to lie; it would not give shadows where none existed, and without shadows, piles of snow against a snowy background could not be called artistic. The light of early morning or late afternoon might have transformed the same scene into a thing of beauty. A noted artist said he mixed his paint with brains. Snowscapes, while devoid of color, need more brains than any ordinary landscape.

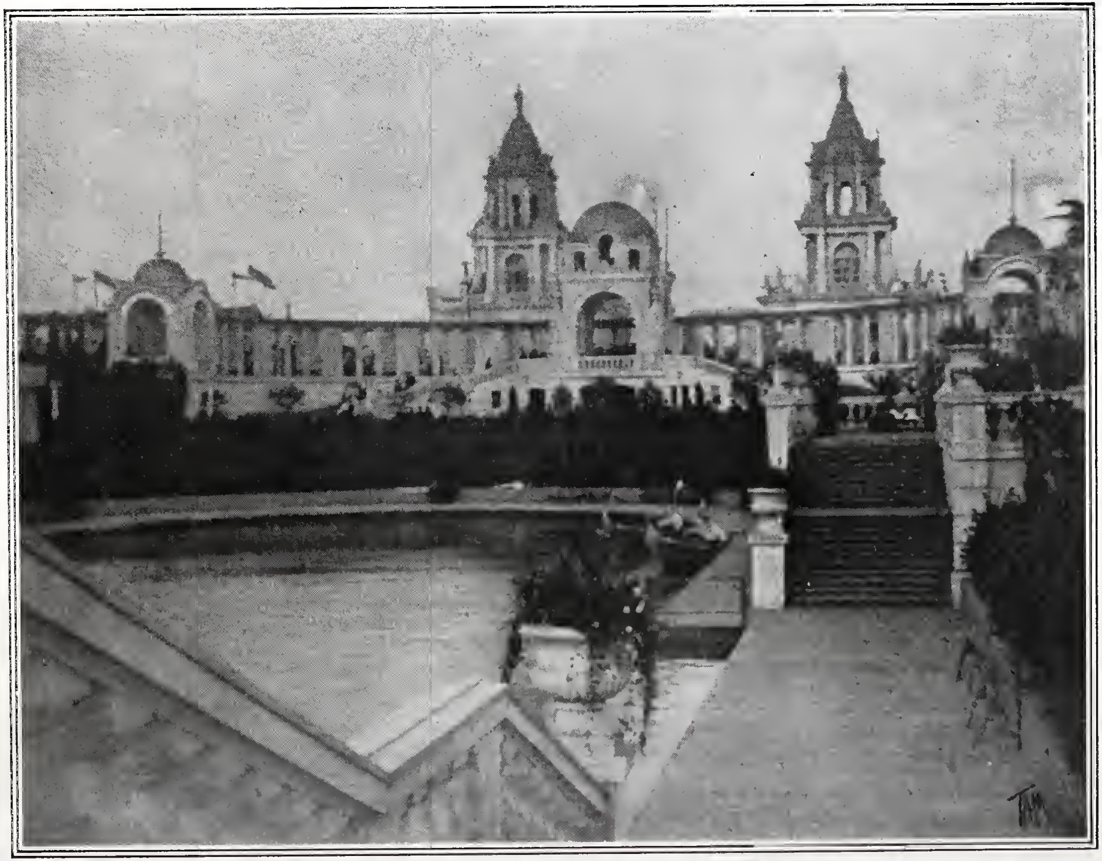
BAITING THE HOOKS

Gilbert Hassell

A private residence upon which a thousand trees had been planted fifty years ago, was being cut into lots for suburban homes. One avenue of Norway spruce, skirted by fruit and shade trees of many varieties, was certainly beautiful, suggesting the majestic in Nature. Remembering that Egyptians had an avenue of colossal statues, I determined to have an avenue of living columns. Selecting a suitable location, an exposure was made, and the plate developed; but through careless handling it slipped from my fingers and was broken into many pieces. Shortly afterward the trees were cut down and my avenue destroyed. All that was left to remind me of it is here shown in the "Six Brothers."

The aforementioned failures may suggest that with our present knowledge some things cannot be successfully phographed, and it is not worth while wasting time and plates on them; also that even amateur photography cannot be successfully practised in a careless manner. Every picture needs thought and care.

COTTONWOODS IN WINTER. Thomas A. Morgan.

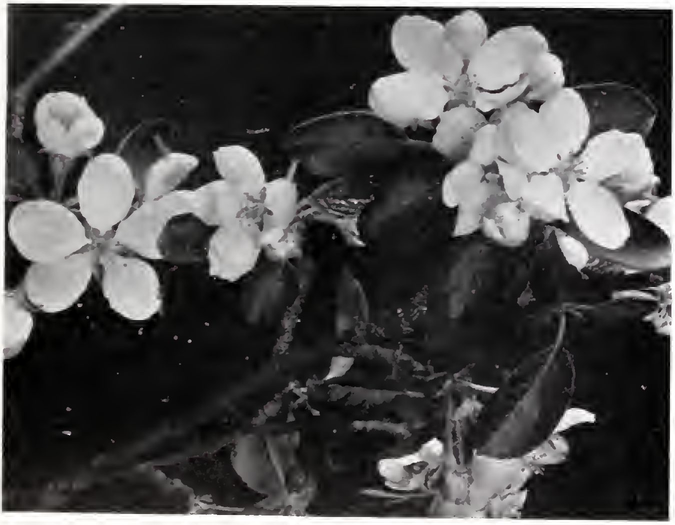


THE GONDOLA LANDING. Thomas A. Morgan.

# A Few Hints on Flower Photography.

### By J. T. Dye.

ALL good photography is difficult, but it is safe to say that of all the branches of photography we find flower work the most difficult to cope with; we over-expose our plates; we do not take proper care about our lights and shades, and never stop to think that our flower when reproduced must have the same value in black and white as our beautiful subject has in color. This at once requires a great deal of thought and one which I hope I may be able to help many lovers of this fascinating branch of work. I have often found it quite necessary to change the colors in flowers entirely before anything like a satisfactory print can be made. We will take for example the accompanying photograph, Apple Blossoms. I selected a branch which was on a line with the eye, so that the



Apple_Blossoms.

camera would be able to be manipulated with ease. I then had a friend hold a large size piece of cardboard back of the branch about four or five feet after taking much pains regarding composition, etc. I then gave my attention to the lights and shadows; this requires some practice as well as care, and I prefer a subject in a bright sun, as I can then change my lights according to taste. I always carry a number of sheets of tissue paper, red, pink, yellow, blue and white, a folding screen about 24 inches square, and three or four pinch clothespins enables me to adjust any color paper I desire on the frame.

HARDY ANNA.

By holding the colored paper between the sun and subject I immediately had a very light pink flower, with beautiful half-tones. As these blossoms were pure white, it would have been very hard to procure a good result when we stop to consider our green leaves, etc. If we have a red rose use the blue paper. Changing the color to more of a purple, the result will be surprising.

EDWARDI ORCHID.

The flower photograph, Orchid (*Hardy Anna*), was very difficult; owing to the contrast of color the lip was a deep maroon shading into orange with violet leaves, tinged with canary yellow. I used in this case an L. Ortho. plate ray filter, and a white tissue paper to soften the lights.

Red Top Clover.

The next photograph "Fleur-de-lis" was taken in a field in the bright sun, with a piece of red cardboard, shaded with a white tissue paper screen.

I have always found a direct light the most essential. Let your bright light penetrate into the depths of your flower, and if the work has to be done indoors, select a place between two windows. Spread your background on the floor, then sharpen a piece of steel wire about 12 inches long at both ends and insert one end in the stem of the flower and stick the other in the floor. This was done with

Fleur-de-lis.

the Orchid picture here shown (*Hardy Anna*). It also allows the blossom to open full, as heavy leaves often droop. Stand the camera directly over your subject, and with a tilting tripod top point the camera down. This method will prove very valuable as it enables the photographer to view his subject from all sides, and with the help of tissue paper to soften light, very beautiful effects may be obtained after a little practice.

The next two photographs I show for the purpose of demonstrating the value of a little brush work on the negatives. This plant was photographed in a hothouse grouped among many others, and when developed did not allow the value of any one plant to be expressed. Painting out and at the same time executing a fair amount of skill regarding our composition we can save a valuable subject which otherwise would appear worthless, owing to the mass which detracts from our subject.

Let our composition be as simple as possible, don't get all our flowers the same height even in photographing them in the field. I have often dropped in a few extra blossoms, on taking out one or two so that the composition would not look stiff as shown in photograph, title Red Top Clover. This picture was taken in the field with a red cardboard background, and by using white tissue paper to screen the direct rays of sunlight a very good negative was procured.

CHILD AND BUTTERFLY. Elizabeth E. Burton.

A COW BOY. LAWRENCE C. RANDALL.

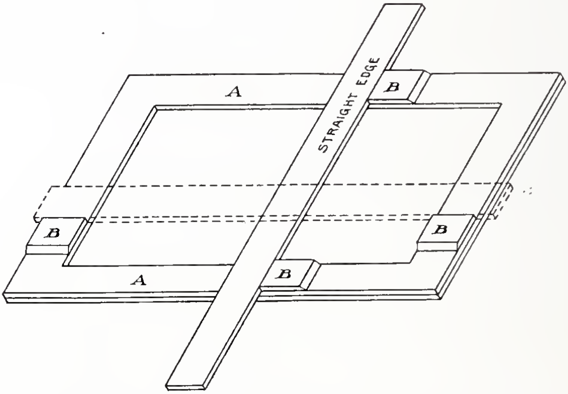
# A Hint to Amateurs for the Improvement of Technique.

*By Ulysses G. Orr.*

EXPERIENCE is the channel through which advancement in photography is gained, and the amateur who devotes a portion of his time to intelligent experiment, is the one mastering the difficulties of this fascinating art in the shortest time and in the most thorough manner. It is the object of the writer to suggest a means by which the doubtful amateur may start the habit of experiment in a comparatively inexpensive way. How many continue to develop without knowing when to stop, or even know what constitutes a good negative, and, when one is obtained by accident, how it was done? The habit of experiment, once acquired, is sure to result in untold improvement. The only implements required to start on this road to experience are a strawboard form, easily made by any one, a ten-cent glass cutter and a short straight-edge. Make the form as shown by the accompanying diagram of a size to take the plate used.

The pieces marked A form a border to prevent the plate from slipping out of place, and should be slightly thinner than the plate. The pieces marked B forms shoulders against which the straight-edge rests while the plate is being cut, enabling the work to be done with a degree of certainty even in the dark. The shoulders, it will be seen, should be so placed that the straight-edge guides the glass-cutter along the centre of the plate each way, thus enabling one to cut a plate into four equal pieces, and, by proper arrangement of these shoulders, eight miniature plates, or any desired number, may be had. The writer uses 4 x 5-inch plates for this purpose, and cuts them into four 2 x 2½-inch or eight 1¼ x 2-inch plates, and finds the smaller size large enough for most experiments. The plates should be put into the form film side down so that the cutting is done on the back of the plate, the film holding the pieces together until all are out, when, by simply bending the plate, the glass separates, then by bending back once the film parts.

Suppose, now, that it is desired to learn the best exposure to produce a perfect printing negative, the subject may be an exterior, an interior, a portrait, or, in fact any subject desired. Cut a plate into small sizes, insert them in separate plate-holders, by using inside kits, which, by the way, may be easily made at home, and expose the series, one after the other, varying the time of exposure gradually from a time known to be too long for the first to a time known to be too short for the last. Put them all, properly numbered, into a tray and develop for five minutes, without regard to whether they are being over or under-developed, then pour off the developer and rinse thoroughly. Now examine all the negatives carefully by reflected as well as refracted light to study the effect for use in future development, but avoid fog from prolonged exposure to the ruby light, then fix them. When washed and dry make prints of all, and it will be easy to select the best negative which



will probably be perfectly developed, and will determine to a nicety the proper exposure for the subject in hand. In addition to the time of exposure, which is now known absolutely under the existing conditions, the appearance of a perfect negative before and after fixing will be known, and this knowledge will be of great assistance.

Suppose, again, that the factor of a certain developer should be desired for factorial development. Keep a record of the time of appearance of the image for each exposure, then, when the perfect negative is selected, divide the total time of development (300 seconds) by the number of seconds this particular negative was in the developer before the image appeared, and the result will be the factor for the developer used.

It is very important that careful record be kept during all experiments, time of exposure, conditions governing light number of each test plate and kind of plate, developer, etc., for upon the accuracy of these records depends the value of the experiment.

Numerous other tests will suggest themselves to the earnest worker from time to time, and they will be of untold value if conducted in a proper manner. The writer has used hundreds of these miniature plates, and has gained thereby invaluable information which is not obtainable from books.

THE TOW PATH. H. P. Dahlen.

THRO' THE LOWLANDS. GEORGE L. BEAM.

# Scenes from Mr. Thomas Hardy's Novels.

*By Thomas Perkins, Turnworth, Blandford, England.*

FEW of living novelists have gained so wide—none so well-deserved—a popularity on either side of the Atlantic as Thomas Hardy. I own to be an enthusiastic admirer of his novels and his poems. There are none of the former that I have not read at least three times, and most of them I am continually taking up in order to read favorite passages, either for my own enjoyment or with the view of introducing the Wessex Novels to the notice of friends to whom they are unknown. The poems I have read so frequently that many of them are firmly fixed, word for word, in my memory.

What is it that makes Thomas Hardy such an attractive writer? Not his plots; for with the exception of one of his earliest books, "Desperate Remedies," the stories are of the simplest character ; there are no tantalizing secrets, no mysteries to rouse the curiosity of the reader. One may "look at the end" without any risk of destroying the pleasure of reading the book ; there is no temptation to skip or skim.

The novels have the charm of a perfectly easy and lucid style. "Young writers," said Mr. Hardy to me, "often aim at being smart, and do not realize that in most cases it is far more effective to tell a story or describe an incident in simple. straightforward language." He then went on to speak of the consummate art possessed by some of the writers of the Old Testament, who were able in a few simple words to paint a striking incident, such, for instance, as the bearing of the tidings of the death of Absolom to David. This consummate art Mr. Hardy himself possesses.

Another charm is the originality of thought, the uniqueness of his way of viewing things. Often, when I have read some passage of his, my hearers have exclaimed: "No one but Hardy would have thought of that," or "No one else would have put it in that way."

It is often said of the successful portrait photographer that his best poses are those he has observed, not those he has created ; and something of the same kind may be said of many of the telling incidents in the Wessex Novels. Mr. Hardy is a most careful observer of minute details and a most conscientious worker. I could tell many stories of the trouble he has taken to arrive at accuracy.

Portrait of Mr. Thomas Hardy.

He chiefly delights in painting, or perhaps we might better say in photographing, rural folk of humble rank, shepherds, millers, small farmers, carriers, dairymaids, laborers, and so forth. Titled person, that seem the stock in trade of inferior novelists, seldom appear in the Wessex Novels. The quaint and original humor of the rustics relieves the somewhat sombre character of many of the stories; sombre because Mr. Hardy aims at depicting life in its stern reality, and knows that the ordinary novel in which, after the hero and heroine have overcome incredible obstacles, all is left smooth and comfortable at the end, is not a true picture of life. Mr. Hardy's characters are faithfully presented; they are not miracles of virtue or vice; they are quaint, homely, but never vulgar. His descriptions of Nature in all her various phases are photographic in their truthfulness; his love for animals and his abhorrence of cruelty towards them are very evident. Truthfulness, humor, pathos, are characteristic of all he writes. Of late he has devoted much attention to poetry, and I know no poems more original than his, we find in them his own thoughts expressed, not mere echoes of other poets.

FAR FROM THE MADDENING CROWD.

His scenes are almost entirely laid in a district which he calls Wessex, roughly coincident with the old West Saxon kingdom. The heart of his district is the county of Dorset. Any one who studies the map of "the Wessex of the

An Egdon Heath. Rev. Thomas Perkins.

LA TULIPE

J. M. Whitehead

Novels," which is given in each of the volumes, will see how the names cluster most closely in Dorset, a few miles from Dorchester, called Casterbridge in the novels, that Mr. Hardy was born. To Dorset he returned when he finally abandoned the profession of architecture for that of literature, and on the outskirts of Dorchester he built himself a house.

THE WOODLANDERS.

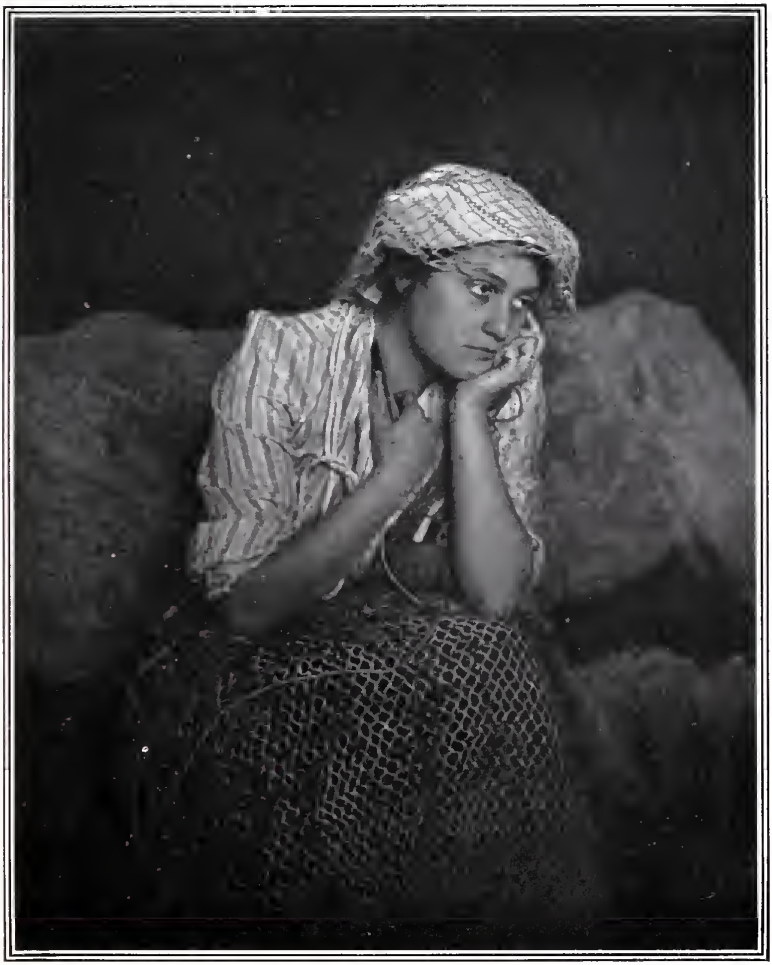
Dorset is one of the counties that has suffered least from the march of modern civilization. In the outlying villages, such as that in which I live, the old Wessex speech may still be found and old-time superstitions still linger. The tourist for the most part has left this district alone; the railways are few; coaches and caravans are almost unknown; but any one who loves nature and varied scenery, wild

TWO ON A TOWER.

tracts of heathland and furze-clad commons, downs never broken up by the plough, rich meadow pasturage, winding streams, estuaries, harbors and cliffs, will find it pleasant to explore this well-known county of Dorset.

For more than a quarter of a century have I lived in the district, and not the least of my pleasures has been on foot, on cycle, in tranter's vans to follow the footsteps of the various characters in the Wessex Novels. Sometimes I have had Mr. Hardy himself as my companion on these expeditions, and he has pointed out to me the spots that suggested to him certain scenes in his books which I had been unable to identify. A camera has always accompanied me on these wanderings, and many are the negatives that I have obtained as illustrations for the Wessex Novels. Prints from some of them are herewith reproduced. I hope in course of time to get at least half a dozen illustrations for each book. Up to the present time I have, in conjunction with a friend, issued six sets of pictorial post cards, six cards in each packet; each set illustrates one of the novels. These cards are reproduced from half-tone blocks, and may be had of Messrs. Perkins & Lee, Organford, Wareham, England.

SAY ! O. C. Conkling.



WHEN MY SHIP COMES IN. GEORGE F. HOLMAN.

# The Rational Application of Caustic Soda to Developers.

***By Henry F. Raess.***

THE use of the powerful alkalies, sodium and potassium hydroxides have never found a very wide application on account of their energy and action on the film and skin. It was thought that they were simply stronger alkalies than the carbonates. Probably the first one to recognize their true action was Dr. M. Andresen. about 1890, and they are used by him in preparing the well-known developer called Rodinal. The investigations of von Hübl (*Die Entwicklung der photographischen Bromsilber Gelatinplatte bei zweifelhaft richtiger Exposition*) has shown the true part played by these hydroxides. The hydrogen in the hydroxyl groups of the phenol and naphtol developers can be replaced by either sodium or potassium, whereas the alkaline carbonates merely make the solution alkaline. The caustic alkalies, $NaOH$, for instance, combine directly with developers forming salt-like compounds. These latter compounds possess properties quite different from those containing alkaline carbonates. They are very energetic, but have no tendency to fog, so do not require any bromide to prevent this. Although made with caustic alkali, these developers contain less free alkali than those made with carbonates, as the compounds formed possess developing properties without requiring the addition of an alkaline salt. All that is necessary is that the solution have an alkaline reaction. The developers can be made very concentrated, and, when so, have good keeping qualities. They require only the addition of a suitable amount of water to make them applicable for developing either plates or papers. While the usual developer, when used weaker than one grain to the ounce, has a tendency to cause fog, these developers can be diluted to one-sixteenth of a grain. This is especially true of para-amidophenol and *Edinol*, the only difference being in the time of development, which in the case of the two latter is about forty-five minutes for correctly exposed plates when diluted to one-sixteenth of a grain. It will be noticed in the table caustic soda was used in preference to caustic potash, as it enables one to make a more concentrated solution, as less weight of the caustic soda is necessary, its combining weight being less. But should the reader prefer caustic potash, 1.4 times as much should be used. To make these developers as universal as possible, the strength in grains per ounce was noted, as all developers give approximately similar results when of similar strength, the difference being only in time of development. The following will apply to *all* developers : For ordinary "snap-shot" work to be printed on "gaslight" papers about one grain per ounce. For full time with good contrasts, say for platinotype, three grains. When used for developing "gaslight" paper four grains per ounce,

| DEVELOPER. | Amount of developing substance in grammes. | Potassium Metabisulphite in grammes. | Sodium Sulphite, dry, in grammes. | Caustic Soda in grammes. | Water. | Amount of developing substance in *grains* per ounce of solution. |
|---|---|---|---|---|---|---|
| Hydrochinon....... | 2.0 | .... | 4.0 | 1.44 | 180 C.C. | 5 |
| Glycin............. | 10.0 | 14.0 | .... | 9.5 | 150 C.C. | 30 |
| Pyrocatechin....... | 10.0 | .... | 25.0 | 7.2 | 200 C.C. | 22 |
| Para-amidophenol. | 10.0 | 30.0 | .... | 13.6 | 150 C.C. | 30 |
| Edinol. ........... | 10.0 | 30.0 | .... | 16.6 | 150 C.C. | 30 |

with the usual few drops of ten per cent. potassium bromide. Bromide papers about the same.

### HYDROCHINON.

No attempt was made to produce a concentrated solution. A good pinch of acid sodium sulphite ($Na\ HSO_3$) was dissolved in about half of the water, then the hydrochinon was added. In the other half the sodium sulphite and caustic soda. In both cases the water was quite hot, after which each was filtered and mixed. It formed an almost colorless solution, possessing far better keeping qualities than the usual solution prepared with carbonate, even in half-filled bottles. It also developed much faster and gave good results on developing papers.

### GLYCIN.

The water should be heated almost to boiling and the potassium metabisulphite, previously powdered, added. The solution should be kept hot, but not boiled, as boiling decomposes the salt and liberates sulphur dioxide. It should be well stirred to facilitate the solution of the salt. When dissolved add the caustic soda, and when this is dissolved add the glycin. Filter if necessary. It possesses excellent keeping qualities. It is probably the best "snap-shot" developer known. The late Mr. Ernest Marx is said (*Haslerisms*, Vol. II., No. 12, page 91) to have used a similar glycin developer for his horse photography. Its action is quicker than the above hydrochinon, but slower than the others.

### PYROCATECHIN.

The solution should be made as directed under hydrochinon. This developer should be kept in small bottles filled to the neck and closed with rubber stoppers. The entire contents of a bottle must be used at once, as the concentrated solution oxidizes rapidly after the bottle has been opened. If the above precautions are taken for the bottling it will keep for months. It is the quickest acting developer known, the image appearing in all detail in a few seconds, after which density comes more slowly. It gives the clearest plates of all developers, and is consequently very suitable for lantern slides.

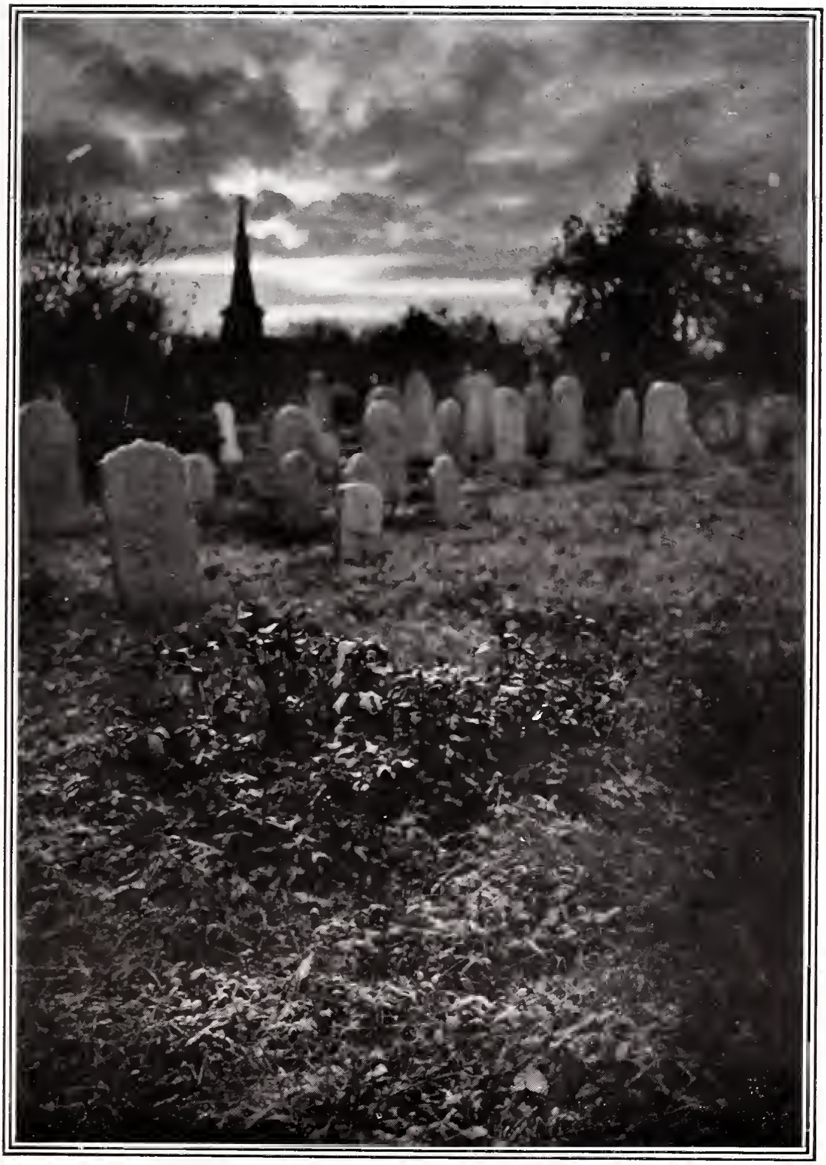
### PARA-AMIDOPHENOL.

The potassium metabisulphite should be dissolved as directed under glycin, using 125 cc. of water. When dissolved add the para-amidophenol. The latter may not all dissolve. In the remaining 25 cc. of water dissolve the caustic soda. Now add the caustic soda solution slowly, with constant stirring, to the other. A precipitate will form, which will dissolve in the excess of caustic soda. Should this not occur—which would happen if the caustic soda were not pure—small pieces of caustic soda must be added to the hot developer until the precipitate is dissolved, carefully avoiding too great an excess caustic soda. This solution forms the well-known *Rodinal* developer, so I shall not dwell upon it.

### EDINOL.

The solution should be made as directed under glycin. Its properties are similar to those of *Rodinal*, if anything even better than the latter. In preparing these caustic soda developers a caution should be noted. As caustic soda slowly absorbs carbon dioxide and thereby becomes weaker, the developer should be tested by wetting the thumb and index finger and noting if the solution has a soapy or slippery feeling. Unless the solution has this property it will probably not develop. In that case it will be necessary to add a small amount of caustic soda until this happens. This method of testing may seem rather primitive, but it is effective.

HEAD OF A BOY. HELEN W. COOKE.



"Each in his narrow cell forever laid,
The rude forefathers of the hamlet sleep."

**W. E. Bertling**

# An Adjustable Retouching Glass Stand.

**By C. H. Claudy.**

I SHOULD have liked to have added the words "home-made" to the above title, but it has been suggested to me that I will get myself known to the amateur public as "Old Home-Made" if I do not stop purveying instructions how to make this, that and the other for next to nothing. I wonder if this is so? How do the readers of the American photographic magazines look on home-made apparatus? Do they think it a waste of time? Do they imagine it penury which dictates the construction of apparatus photographic at home, or do they agree with me, that any act of intelligent creation is an educational proceeding, and regard skill and ingenuity in the manufacture of home-made apparatus as things to be cultivated?

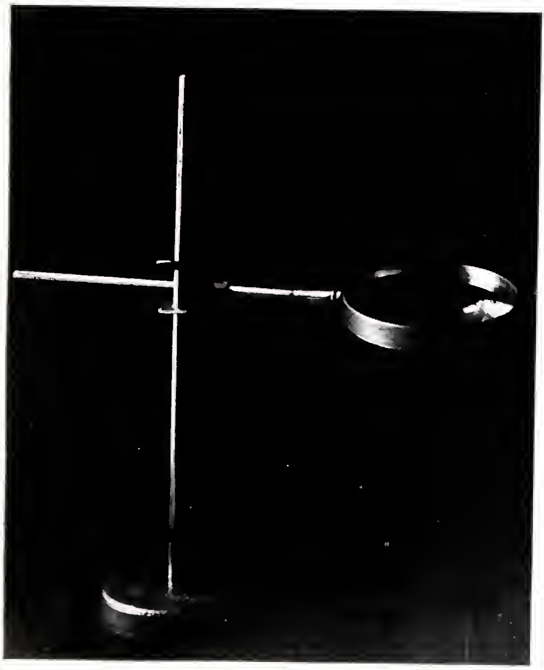
Personally, the need for apparatus is never ending. Some, beyond my skill, I buy. What I can make, I can usually make more to my liking than what I can buy, even some I have to do without entirely. Recently I had to do some extremely delicate retouching. I am not an expert retoucher, so the services of a professional were indicated. Unfortunately, however, I knew the best-intentioned retoucher would do exactly what I didn't want and leave undone what I wanted done, inasmuch as these negatives were of microscopical objects and needed retouching with a full understanding of their nature and structure. Nothing would do, then, but that I must make the best of my unskilled fingers. Half an hour proved that I could not do the work without a glass, and five minutes showed me that the glass must be held for me—I needed both hands for the work. The result was a determination to make an adjustable retouching stand, and since its manufacture I wonder how I ever got along without it. So I am going to tell you how I made it, hoping that the comparative simplicity of the operation will lead you to do likewise. I should mention, perhaps, to those who enjoy such a piece of work the more when they realize that a monetary saving is being made, that the total expense was about ten per cent. of what a similar bought stand would be, although, I grant you, the store affair will look the neater and the brighter.

In making any piece of apparatus, the first thing to do is to determine exactly what is wanted, then devise the way those ends are to be attained. This may seem an obvious thing to say, but I have learned by sad experience that unless the thing to be made is carefully thought out beforehand, the thing made is often far from what is desired, and consequently unsatisfactory.

In the present case what is wanted is a means of holding a reading glass or retouching glass (same thing) at any angle, at any height from an inch to twelve inches from the table and capable of being adjusted with ease, preferably with one hand. It must be simple enough to be made easily, strong enough to last, and require no expensive parts. By a process of elimination, which must be obvious, ball and socket joints, delicate counter weights, etc., etc., are, by the above specifications, out of the question. The solution of the whole matter may be seen at a glance from the accompany illustration and diagram, but detailed instructions for the manufacture are given below.

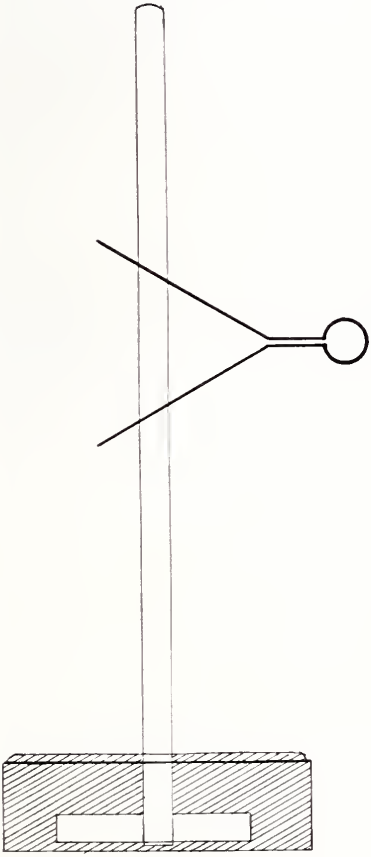
The first thing to do is to purchase from a hardware store two feet of brass rod, perfectly straight, and one-quarter of an inch in diameter, two pounds of lead, either sheet or scrap or pipe, bullets, shot, anything so it is lead ; a small piece of brass tubing, three-eighths of an inch in diameter and two inches long, a strip of one-sixteenth inch brass three-quarters of an inch wide and four inches long, and the glass you are to use—this last, of course, not from a hardware emporium. The glass may be any reading glass or magnifying glass you happen to possess, or one may be purchased for about fifty cents. Two, to two and one-half inches in diameter is plenty large enough. Finally you will need a hot fire, a small stove shovel, a file, a drill, and the top to a pound can of soda, such as you buy for developers.

To proceed, first cut with the file the brass rod into two pieces, one of which will be the extreme height you want



the glass to be above the surface on which the stand is placed. Mine is ten and one-half inches from base to tip. One end of this rod is to be carefully and nicely rounded with the file, and the other tapered for half an inch, so that the end will caliper a scant three-sixteenths of an inch. Next, bore through the short piece of tube with the drill a hole three-sixteenths of an inch in diameter, of course at right angles to the hole through the tube itself. This done, insert the tapered end of the rod in the hole bored and drive the tube firmly onto the taper, so that it forms a T with the rod. If the end of the rod projects more than one-eighth of an inch through the tube, after it has been firmly driven on, this projecting end should be filed off, or riveted over the tube, so that it does not stick out more than the amount mentioned. The purpose of this T will be seen in a moment.

Next, form the four inches of brass strip, three-quarters of an inch wide and one-sixteenth of an inch thick (I forgot to say it should be spring brass) in the shape seen delineated by the heavy black line in the diagram. The circle is the end view of a short tube, formed the length of the width of the strip, and which should be slightly larger than one-quarter of an inch in inside diameter, so as to allow the quarter-inch rod to slip easily, but without play, through it. This is a condition easily secured by bending the brass strip around the rod and hammering true. The bends in the straight part of the brass can be made with pliers or with the hammer, or in a vise, if one is handy. Near the ends of the strip bore holes—it does not make much difference just where, mine are one-half inch from the ends—which may be either seven-thirty seconds, or five-sixteenths of an inch in diameter. If now the ends of the strip are sprung apart and then drawn together enough to allow the brass rod to be slipped through both holes, and the slip is then released, it will be found that the outward spring of the brass causes the edges of the holes to bind tightly on the rod. A simple pressure on the two ends, towards each other, releases this binding action, and enables the strip to be moved up and down the rod with ease. Lay this formed strip aside with the brass rod made into a T with the tube and commence work on the remaining piece of brass rod, which should not be cut down to the desired length until the job is all but finished, for a reason which will appear later. The problem now is to fasten the glass to the end of this second brass rod. If you intend the glass to be a permanent fixture on the stand, which is much the better way, the task is sufficiently easy. Most reading glasses are confined in a metal frame provided with a split screw at the ends, which fits into a tapering, threaded sleeve, which, in turn, is attached to the wooden handle. Remove this sleeve from the handle, bore a hole through it and through the end of the brass rod, slip through these holes a brad, cut off to the right length and rivet, and the glass and its frame can be screwed into the sleeve, now mounted on the brass rod, as easily as it could when mounted on the wooden handle. If it does not fit tightly enough, put a few drops of melted lead into the sleeve and screw the frame down tightly against this.



If it is desired that the reading glass be kept intact for other uses, the easiest thing to do is to bore a two-inch hole, one-quarter of an inch in diameter, longitudinally through the wooden handle, and mount it on the standard by sticking the second brass rod up into this hole. Other methods, such as providing brass clips on the brass rod to clasp the handle of the glass, will suggest themselves to any one with a mechanical turn, but need not be described here. Reading glasses are so inexpensive that you will be able to afford one for this purpose alone, I am sure

The fine work all done, we can turn our attention to the casting of the base. Take the tin top to the can of soda, wash it, dry it, and scrape off all the paper. Set it on a board you care nothing about. *Don't* set it on the top of the polished dining-room table, because the melted lead you are going to pour into this top is hot, and the top will get hot, too, and burn what is beneath it. If you possess a vise it is best to hold the brass rod in its jaws, and see by a square that it is upright before casting. The T end, of course, is the lower end, and should rest on the bottom of the inverted tin top. It should also be in the exact centre of the top, ascertained with the eye, or, if you haven't a straight eye, with a pair of compasses.

If you haven't a vise, hold the brass rod as nearly straight as you can with one hand, and get a friend to look at it at right angles to your line of vision and manipulate it as he tells you, so that it is a true upright. Of course, see that the board on which the inverted tin top rests is level.

You will have previously put your two pounds of lead in your small fire shovel, and the shovel on the hot fire. It will not take long to melt, nor long to cool again after it is melted, so do your pouring as quickly as you can. Fill the inverted tin top full, even to overflowing, and then, as the mass becomes cooler and semi-solid, give the last adjusting pats to the end of the brass rod to see that it stands straight. It is now obvious what the T is for. It not only serves to hold the rod straight, after the mass has solidified, but prevents it from pulling out. The tin top is too shallow to allow the rod to be imbedded in the melted led without some such crosspiece, if stability is desired. I know, for I tried it twice, and it wobbled both times!

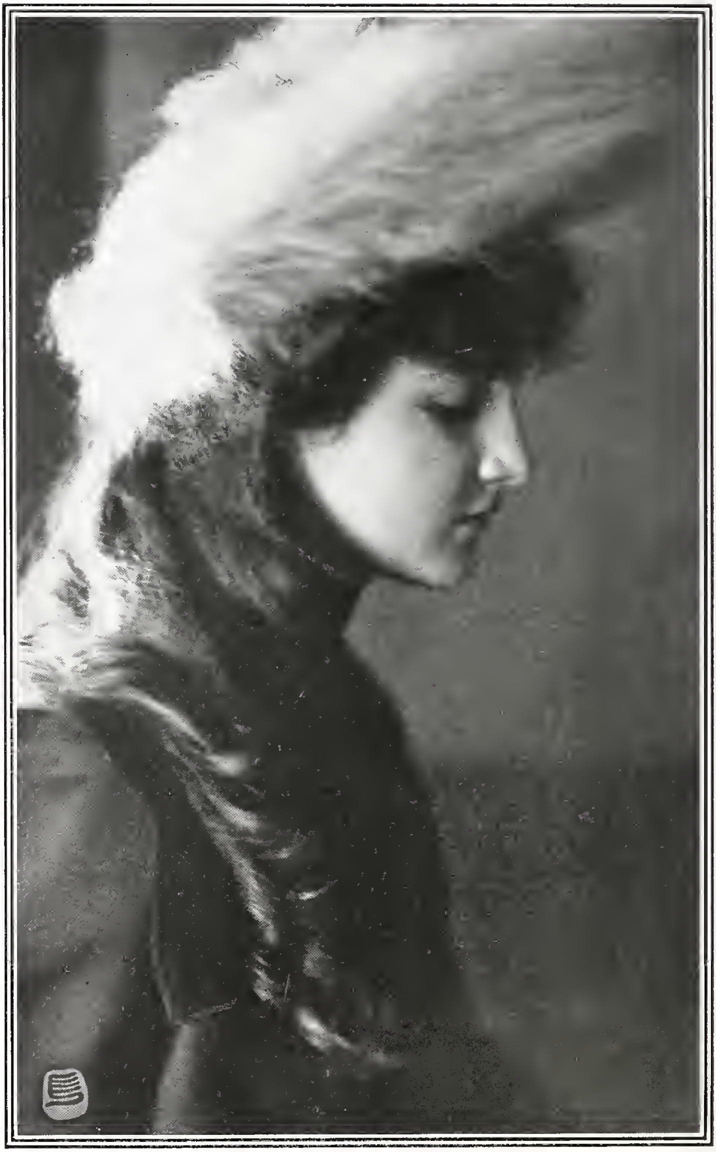
If any lead has overflowed, it can easily be removed with a coarse file or a knife, but don't use a file you care anything about on lead, as it fills up the teeth very fast. The diagram, which is a sectional view through the centre of the standard, will show the arrangement of the tin top, the lead, and the T end of the brass rod, even better than the description, which I trust is clear. After the lead is cool, and finished either with a knife or file, and the rough top made smooth, all that remains to be done is to slip on the bent brass strip, and then push through the little tube, the other brass rod bearing on one end the glass. Raising the strip to the top of the standard, pull the glass and its rod away from the standard until the whole affair commences to topple over. Then cut off the rod to which the glass is attached the proper length for extreme play within the limits set by the action of gravity. No instructions can be given for the exact length of this rod, inasmuch as different glasses will have different weights and different tin tops will hold varying amounts of lead.

The whole can be nicely cleaned with sand or emery paper, and the base touched up with any kind of paint handy. Mine is extravagantly gilded, because I happened to have some gold paint.

The whole forms a stand for the glass, which allows every adjustment, and which can be made in an hour, at small expense, yet which is as serviceable as you could buy at many times the price the materials cost you; and besides, you have the pleasure of making the thing, and the pleasure of using your own apparatus, if it is well made, is many times greater than that which comes from the use of things you are dependent upon others to make for you. Try it and see. And don't forget that I want to hear what you think of the question of home-made apparatus.

Don Carlos. Jos. R. Iglick.

THE WATER SUPPLY. LOUIS FLECKENSTEIN.



"TAM-O'-SHANTER"
Carl E. Semon

# Don't Scatter Your Shot.

*By Fayette J. Clute.*

I BELIEVE the individual worker would derive more, much more, satisfaction from his photographic work if he would but be a little more sane in the application of his efforts. There can be no doubt but that photography itself would be greatly the gainer if its devotees would only be more rational and consistent in the direction of their enthusiasm. It is the running about from one line of work to another that keeps them from advancing above the plane occupied by the vast army of ordinary amateur photographers.

It is an undeniable fact that a large portion of those who take up photography are so constituted that the artistic aspect or even the artistic possibilities of the work do not appeal to them. This is but natural. Photography is a many-sided study, and were we all looking for that higher quality with which art is supposed to endow our productions, we would have litttle or no advancement along any other lines. For this reason we should not quarrel with the man who finds the optical, the chemical, or the mechanical part of the study more to his liking. Neither should we be more critical in the case of the individual who finds in photography but a method of reproduction, a system of recording facts, or a plan by which some other line of work may be facilitated. The poet is not alone in making use of language. The musician does not claim entire dominance over sound.

What I wish most particularly to impress upon the minds of my readers is the importance of determining for themselves the line along which each shall expend his own efforts and seek for the gratification of his own desires for profit or pleasure from photography. The worker who builds a new shutter to-day, who attempts to produce a salon masterpiece to-morrow, and who discovers a chemical formula the day following, will find that his enthusiasm wanes as his results lack that quality of satisfaction which are achieved only by persistent and well-directed study. I do not wish to imply that the camera user should take his work too seriously. There is as much danger in one extreme as in the other. I do, however, plead for a more consistent use of the facilities placed at our disposal. Let the worker whose inclinations lead him in a certain direction follow that, and refuse to be diverted by the tempting of the other, whose appreciation is for an entirely different side of the matter.

I have in mind as I write a couple of examples that will serve as illustrations. One is a friend who has made a special study of so prosaic a subject as the stripping of films from their glass or celluloid support. Every method suggested has been given a most careful test. No sooner does a new process secure publication than it is brought to his attention. Each new experiment is made more intelligently owing to the cumulative effect of experience gained in former experiments along the same lines. The possibilities of failure are understood and the difficulties rightly located. There is no element of doubt concerning the right way of going about any new method of procedure. The result is that my friend will some day prepare a contribution to photographic knowledge that will be of value. In the meanwhile he derives that satisfaction which comes of being a thorough master of a subject, let that subject be as lacking in importance as it may.

The other example is a correspondent in another state. His hobby has been the photographing of birds and their nests. His results in this particular line are perfect. Not only this, but his collection of negatives has a value that could not be equaled by the combined apprizement of those possessed by a hundred collections of the same size but embracing the ordinary photographic work of the amateur. Each new negative increases the value of all the others. The work becomes more fascinating as his results become more gratifying. The pleasure he derives from the knowledge that his work is superior to that of others only serves to spur him on to greater achievements.

The opportunities for making a special line of work the dominant study are limitless. Each worker must decide for himself. He is only to be governed by his own tastes and the possibilities at hand for gratifying them. The resident of an inland district could hardly be consistent on choosing marine work as his intended forte.

The resident of a large city would not be wise in selecting pastoral life as his specialty unless his leisure permitted him to take often trips into the rural districts. And so the selection should be governed.

Before closing I would like to repeat that I do not advocate the entire avoidance of any work not in line with the selected specialty. The same camera will make a variety of work. What I really wish to suggest is that the worker should increase the efficiency of his results by concentration of his efforts that each new fact acquired and each added facility of hand or mind will have its effect for good on work to follow. This is the real secret of success. Let your aim be to increase your chances of success by availing yourself of the cumulative effect of repeated effort in one direction. Photography has entirely too many branches to allow success to crown unthinking and unsystematic practice in a multitude of directions.

HOTEL VENDOME, BOSTON. J. EDWARD GREENE.

# Anti-Chemistry of Photography.

**By Robert E. M. Bain.**

TOO much attention is given to exactness in mixing and weighing chemicals or, in other words, in strictly following formulæ, to give the necessary experience that does and should accomplish the best results. I do not mean that one should not follow the formula as printed, but it is well to know that results are acquired by building up on experience and the latter is not acquired if a cast iron policy be observed.

Formulæ are announced in the journals as being those proportions of certain compounded or combined chemicals, calculated by the composer to give the best result and is based on experiment on his part.

It must occur to the reader that it does not necessarily follow that this is ultimate. Does it not rather prove that it is a basis for results, the improvements of which can be brought about by further experiment?

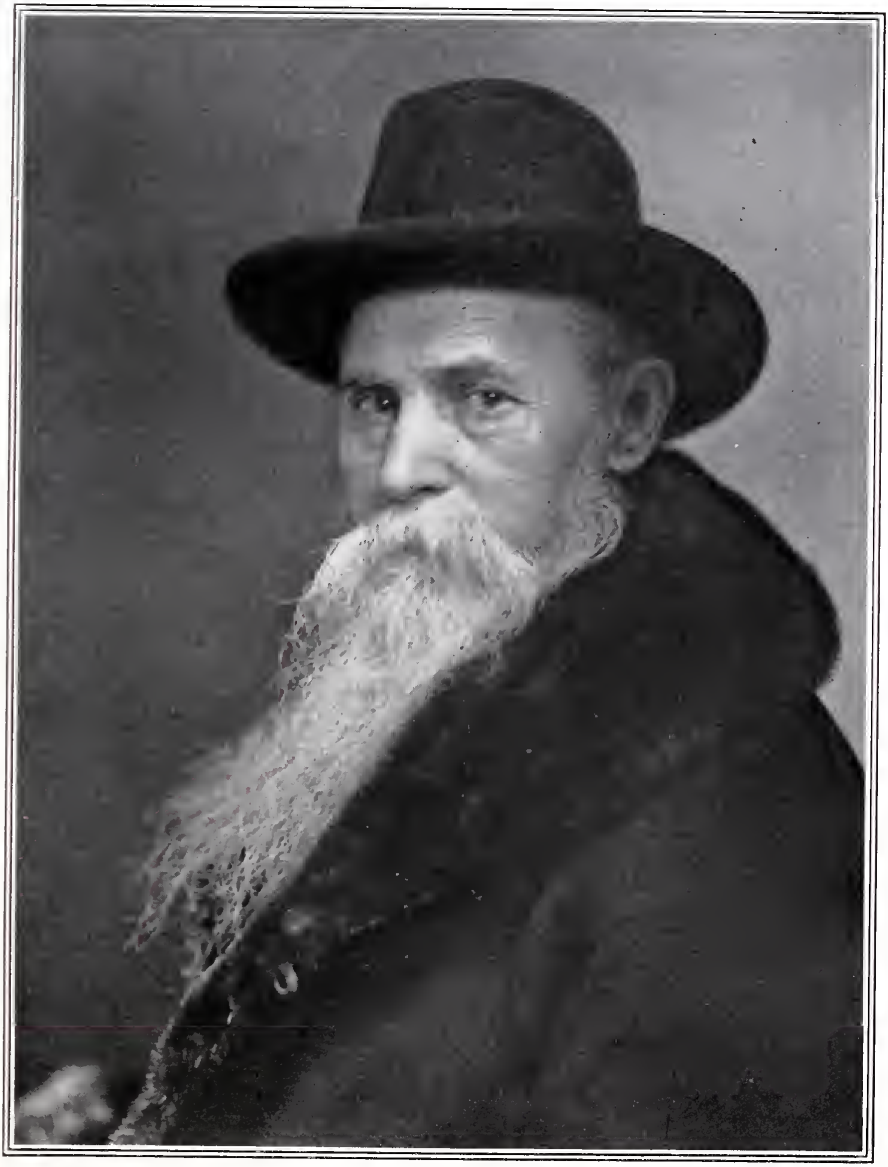
A prominent plate-maker said to me a short time since, when congratulated on certain plate results he had evolved out of his experiments, "I guess it came about because I am not a chemist, but rather a compounder." There is much in this idea. A chemist constantly seeks further chemicals to obtain his improvements, while the compounder, knowing little of chemistry, is apt to get better results from proportions and precedence of standard formulæ. The chemicals are generally all right, but conditions of temperature, humidity, strength of emulsion, date of coating of the plate and other data of this kind, make a considerable difference, and they have to be met by counter action in preparing the mixture used for development or other purpose. The chemist will carefully follow the formula, but the compounder will, on test, so vary it to suit conditions as to frequently obtain much the better result.

We appeal to the chemist to supply a compound to obtain a fixed result under certain known conditions, but when that condition varies, as it frequently does, should we not use some individual ideas based on the formulæ to overcome obstacles and thus bring about the best finished product ?

It appeals to me that this is a logical idea, and the results obtained by friends who make it a practice to use their own judgment fully bear me out.

Individuality is as much necessary in the chemical manipulation as in the selection of view or the proper amount of light and shade required for a perfect picture.

Springtime. J. H. Field.



PORTRAIT.

H. S. REDFIELD.

# Photographing in New York.

*By Frank M. Ingalls.*

WHEN one "goes photographing" in New York he must specialize, for the time being, as the range of subjects is too great for any one outfit to properly cover. For instance, a reflecting camera with fast lens and focal-plane shutter, is an absolute necessity for use on the speedway or at the race track, while it would prove almost useless in the sky-scraper district.

The camera used on the latter must be one with short, square bellows, to allow of raising the front so the lens will be about opposite the top of the plate, and must have a generous amount of swing to the back.

The lens must be an extreme wide angle—even a "hypergon" may be necessary in certain places—and must have good covering quality and small stops.

The pictures of "Park Row" and "St. Paul" buildings represent about the limit to be obtained with an ordinary cone bellows-view camera, using a 6½ x 8½ wide angle lens on an 8 x 10 plate.

The *Times'* building is an easy subject from the north, as the open square provides the necessary amount of distance and can be done with a good ordinary outfit, with rising front and swing

A Fair Load.

A Rag Picker.

Among the Sky-Scrapers.

back, and even good results may be had with a hand-camera by choosing the point of sight far enough away to include the top of the building in the finder without in the least pointing the camera upward Views from Broadway, showing the southeast corner of this building, may be made in the same manner, as also many views showing the southwest corner if a point of sight be chosen a few blocks down on Seventh Avenue.

The "Flatiron."

Park Row Building.

The "Flatiron" or "Fuller Building," at the junction of Broadway and Fifth Avenue with Twenty-third Street, is similarly situated. The only disadvantage is that they both face the north, and one must choose an overcast day or be on the spot early in the morning to avoid pointing the camera toward the sun when making the exposure. A color screen will assist in rendering the necessary contrast between building and sky if used with an isochromatic plate.

A very pleasing view of the "Flatiron" may be made from a point on Fifth Avenue, a few blocks south of Twenty-third St.

A backed plate is a great advantage in this class of work to prevent halation from the sky, and when once used the little trouble of backing is more than compensated for in the sharpness and brilliancy of the resulting negatives.

St. Paul Building.

Times Building.

Many points of vantage for panoramic views among the sky-scrapers gives one an idea of the vastness of these buildings, while on the other hand their heights may be shown from a view of the streets. In places where the streets are narrow and lined on both sides with the buildings a perfect chasm is formed.

The sky line of lower Manhattan is a very interesting subject, as it is constantly changing from year to year. Tall buildings rise here and there only to be dwarfed in the near future by more lofty ones. The tendency is to go a little bit higher to obtain unobstructed drafts of air and to assure daylight in the offices.

One of the Chasms.

The "Park Row" building holds first place in point of height. being about 447 feet from the sidewalk to the top of flagpole. It is expected, however, that this prodigious height will soon be exceeded by the tower of the Manhattan Life Insurance Co.'s building, which will be a little less than 560 feet above the level of Madison Square, toward which it will face. With this tower in close proximity the "Flatiron" building, with its height of 300 feet, will be dwarfed, and the surrounding buildings of five to eight stories will cease to be noticed except as an example of the "has beens." Many beautiful buildings of lesser height, but more artistic in design, are to be found scattered through the city, including banks, hotels, apartment houses, department stores, etc.

As one passes through the streets in the sky-scraper

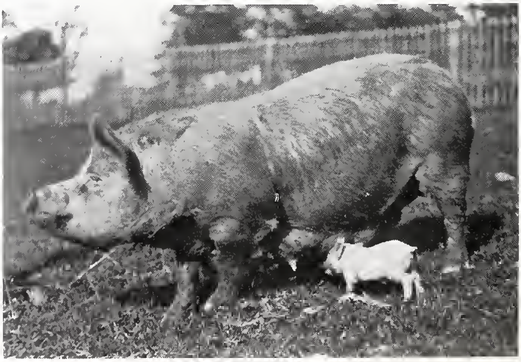
Passing Hell Gate.

In Central Park.

district, attention is attracted to the number of men, women and children who collect wood, boxes, barrels, etc., and carry them home on their heads or backs. Sometimes they have just all they can carry, and one then asks the question "Is life worth living in such circumstances?" The answer is evident, as some of these poor people know no other conditions, having been brought up to do this work in this way. Even children two or three years old are seen trying to carry some small box or bundle on their heads.

If one desires photos of natural scenery they may be found in plenty in the parks, but it is now necessary to procure a permit at the Arsenal, in Central Park, before one is allowed to use a camera in any of the parks in the boroughs of Manhattan and Bronx. Even the possession of such a permit will not be recognized in the Bronx Zoo, and cameras must be checked at the entrance gate. The expense of a permit is nothing, but the trouble to obtain one is considerable, as none are issued except during business hours, 9 a. m. to 4 p. m., and none can be obtained on Saturday afternoons, Sundays or holidays.

If pictures of boats are desired, a greal range of subjects may be had along the rivers and down the bay, varying in size and kind from the small rowboat to the largest ocean liners, including yachts, pleasure steamers, lighters, and even the old three-mast ships of other days.



"THIS LITTLE PIG STAYED HOME." Winfield S. Cline.

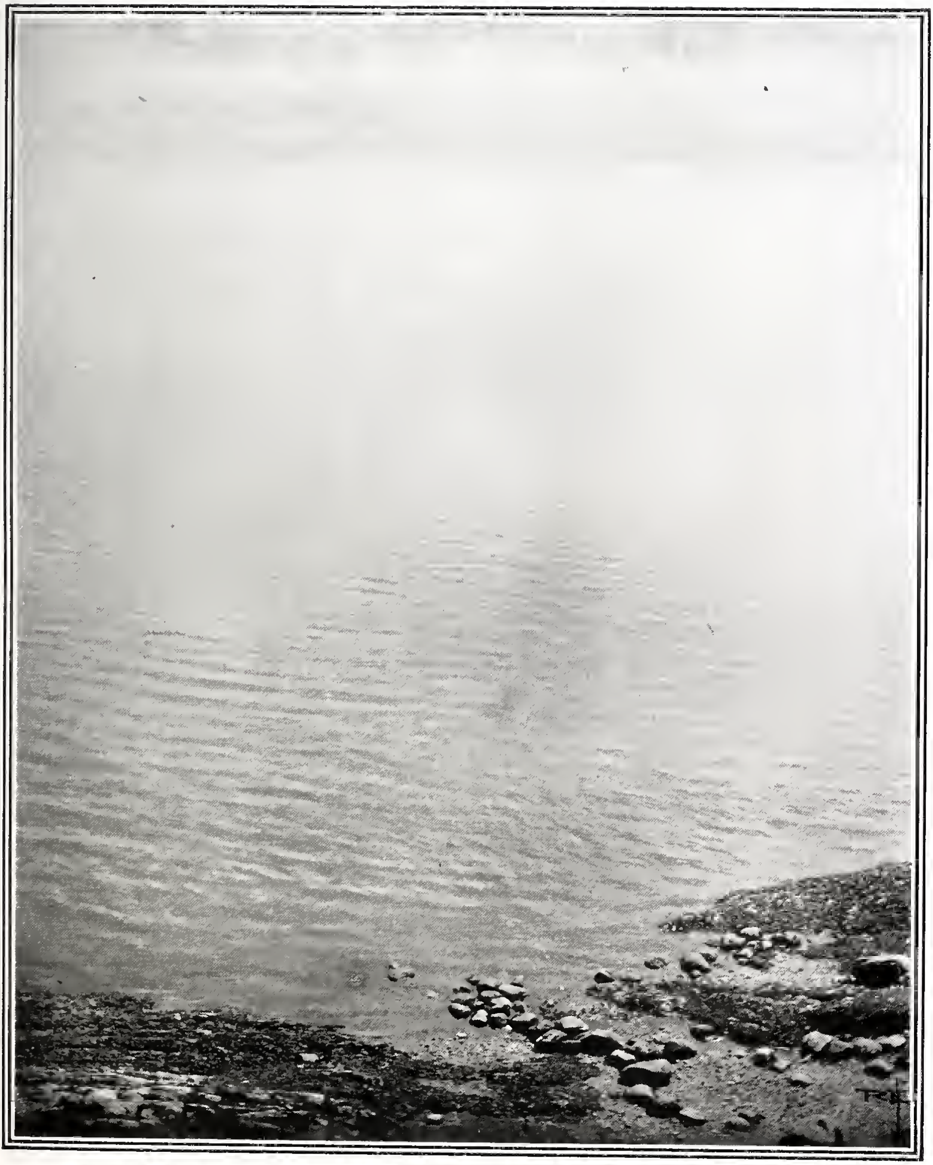
DUTCH LANDSCAPE. E. WILLIAMS.

# The Broad Movement in Pictorial Photography.

By Louis A. Lamb.

FOR several years after the appearance of the "pictorial cult" in photography its leaders, resting in the philosophy of the rather ultra Mr. Whistler, assumed that the new school was for the predestined few and not for the universal many. Naturally, too, they fell into the errors, rather than the virtues, of the beauty philosophy of William Morris, and began to exalt above its true value the worth of paucity as a "quality" of pictorial photography. Precisely as the "arts" and "crafts" faddists insist that a hand-made silver piece is intrinsically better than its electro deposited replica, so the "pictorial" high priests enunciated the doctrine that "uniqueness" was the test of "salon quality," and that scarcity of the product proved its superiority. Accordingly, those whose very courageous labors had given real artistic status to typic pictorial photographs, immediately set about the suicidal task of repressing the movement they had started for the popularization of really excellent photography, and their withdrawal from all communion with the general camera workers was announced.

The first result of this erroneous movement was to restrict every effort from the outside to gain the sanction of the acknowledged masters of "pictorialism" on work variant from the original type of the "salon cult." The second was to convey to the unreflective and inexperienced



ACROSS THE BAY

**Rudolf Eickemeyer, Jr.**

camera worker an idea that a certain approved mannerism was the standard of all pictorial excellence. The third was to make salon endeavor fruitless to all new men and women who persisted in seeing and depicting beauty in variant ways.

And when it seemed as if "pictorialism was about to die of prolonged in-and-in breeding within the narrow circle of the high priesthood, no infusion of virile, vandal blood being tolerated, just then The Salon Club of America was founded and the "Broad Movement" began. Directly consequent thereto we observe that there was a recrudescence of originality and a revival of enthusiasm among the pictorial workers of the whole country, so much so that the regular activities of the Salon Club now comprehend the whole area of the United States, with the important coöperation of able workers in the Dominion and in Europe.

For a time the passion of the movement seemed to be imitation of the earliest models of the cult, and there was painfully evident a certain weakness done to self-repression and vain efforts to copy good models. But to-day copying is not a feature of the "Broad Movement." Our best men are evolving new and original styles and enlisting the most diverse individualities in the great work of elevating to its proper high standard that most universal of civilizers and educators—Photography. "Many schools in art and all good," is the slogan of the new movement, whereas the ostensible motto of the old cult was "One school of art and that ours."

Under the banner of the Federation of Photographic Societies and of The Salon Club of America stand several hundred men and women, in many different cities, all striving to show the way of escape from the thoughtless veritism of the camera, all earnestly seeking to make popular the "Salon standard" of pictorialism—namely, that which realizes the artistic capabilities of the camera and disentangles the beautiful from the commonplace, according to established canons of immemorial authority.

The results of the "Broad Movement?" Read them in the vast improvement latterly, in the quality of photographic illustrations in countless books and popular prints.

Witness the decadence of the heedless "snap-shotters." Witness the portfolios of the Salon Club, full of sincerity and originality; free from pharisaical pose; free from insularity and hauteur; rich in helpfulness, abounding in red blood, and vital with the enthusiasm of high endeavor! So that we have valid ground for hope that the day will soon dawn on a host of true artists and idealists equipped with that acme of artist's tools—the camera, and using it for the universal dissemination among mankind of the true artist's love of that which is good and his preference for that which is beautiful.

IN THE PASTURE. Daisy Wilson Adams

# The Value of "Snap-Shots."

***By W. I. Lincoln Adams.*** *With Illustrations by the Author.*

Picking Daisies.

WITHOUT underestimating the value of a tripod camera with glass plates for careful pictorial and other serious work, I should like to briefly emphasize in this article the real importance and value which may attach to casual instantaneous exposures made on films with the excellent little hand-cameras, which are now to be had at almost any shop for a dollar or two.

Such exposures, coming under the general classification of "snap-shots," as they are almost universally called, are often carelessly made, in the spirit of frolic, it may be, of a group of friends, a family party, or some young children at their play. But the uncertainty of life, causing, perhaps, the disappearance of one of the bright young faces from the happy group, may give that particular little snap-shot a value far beyond the measure of mere dollars and cents; as it may contain the best or only portrait of the lost child or friend, and thus become the basis for a satisfactory enlarged likeness, or a trustworthy model for a miniature or other painted portrait.

Feeding the Chickens.

An album filled with snap-shots of a family of young children, taken at different ages and at their various sports and pastimes, in summer and winter, grows in interest and value with the passage of years until it, too, becomes a priceless possession. I know of one father and mother whose hearts were cheered during a foreign journey by the weekly enclosures of such snap-shots of their young children taken almost daily at their distant summer home.

And what a help and satisfaction is the collection of progressive snap-shots in the development of an interesting

A Family Party.

enterprise, such as the laying out and cultivating of an extensive garden; the establishment of a summer home with suitable surroundings in the country, or by the sea, or in the development of any enterprise, like building, commercially, or for one's own use. Such a collection becomes an actual record of far more interest and value than any written description or drawings could possibly be. I know of at least one lawsuit which was decided in favor of the possessor of such a series of snap-shots of a building in the process of construction.

Of course, there are innumerable other cases which will at once occur to the reader, where even the most casual snap-shots may become of the greatest value. Personally, I think these excellent little hand-cameras are worthy of careful and respectful use. They are capable of making most satisfactory little *pictures* as well as merely snap-shots when thoughtfully employed, and they should, therefore, always be used so as to secure the best possible results under the circumstances.

IN THE HOLLY HOCKS.

A TAIL PIECE.

PORTRAIT. Studebaker Studio.

# Plain Roast. *By F. Dundas Todd.*

IS photography a profession or a trade, if neither, what is it? If a profession, those who follow it ought to be familiar with the theory that underlies all practical manipulations. The doctor, dentist, druggist, lawyer, preacher—all of them learn the theoretical principles pertaining to their occupation, and to attain this end they devote several years of their time in attendance upon an educational institution and are as a conseqence known to the world as professional men. But who ever heard tell of a photographer who was familiar with the theories of his craft? In his daily work he performs some very wonderful chemical reactions, but it may safely be said he is as absolutely ignorant of chemical principles as is his better half, who performs just as wonderful chemical reactions when she bakes bread, but is equally ignorant of chemistry. Nobody ever heard of a professional baker, notwithstanding the fact that almost every woman manager of a household is an amateur. The mere fact that there is possibly a million amateur photographers in this country is not a good and sufficient reason why the man who endeavors to make his living by the art should call himself a professional man. His foundation must be much more secure in order to honestly claim the title. He must undergo a special course of study before he can be recognized as such. The world practically recognizes the hollowness of his claim by declining to award him either the emoluments or the social status.

Is the photographer a tradesman? Let us see. If I go to a mechanic of average ability with a plan of something I wish made, or give him some object that I wish to be duplicated, I am reasonably certain that the finished product will be according to the specifications. A mechanic can aim at a desired end and attain it. Can a photographer do that much? My experience tells me that very few can. He is presumed to be an expert in the handling of light, in the arrangement of lines and spaces. He talks wisely about posing and lighting, yet if you set him some simple problem, in almost every instance he will fail. He certainly is no tradesman, and I am glad that there is at least one honor he does not claim when he is not entitled to it.

For many months I have been having a rather peculiar experience with about one dozen photographers. At their request I organized a little convention, which meets monthly, and am filling the office of class leader. Several years ago I organized such a group on a much larger scale, the idea being to combine social and educational features. We met in the evening, devoted about an hour and a half to the enjoyment of a first-class meal, then proceeded to spend at least an hour in the study of pictorial principles applicable in portrait photography. To further this aim I went to the trouble of securing hundreds of lantern slides that were made from negatives from the studios of the leading photographers in this country. But I found that the average man was so little interested in his future progress that when the slides were thrown on the screen all he could do was to behave like an ill-mannered cub of nineteen, and made such noises as one hears from a boy of that age. Of course, I dropped the whole proposition.

When this recent group was formed I insisted that the meetings should be held in the daytime, as I intended that it should cost each member money, at least indirectly, so that I would be certain no fooling would be indulged in. I also insisted that for each meeting a certain problem should be chosen, which was to be followed during the month as much as possible in the ordinary course of sittings. In other words, I put them tight up against the mechanic's standard.

The result has been eminently satisfactory. Most of the members have toed the line faithfully; as a matter of fact, they know they will be expelled from the group unless they attend to the work that is outlined for them. All are showing a decided improvement in their work, and at least there have made marvelous strides in a very few months.

There is a moral in all this. Most of the members of this little group are old convention hands—men who rarely permit a year to pass by without attending at least one gathering. Frequently they go to two of them—the National and the State—but one and all insist that they learn more in one short month working for a definite objective than they have absorbed in attendance upon conventions for years, while the cost is a mere nothing.

At the St. Louis Convention one photographer remarked to me that in his estimation our associations were about to make a break in some new direction, and for his very life he could not foresee the result. There is, undoubtedly, a great pleasure socially to be derived from attendance upon the average convention, but I find that most photographers are disappointed as to the educational and financial result. How can it be otherwise when one considers that such portraits as are hung on the walls are not the product of definite aim, as a rule, but are the lucky accidents of the year.

Why the financial end of photography should be so thoroughly ignored in conventions I am at a loss to understand. Somehow photographers do not seem to realize that they are in business for profit and that they must follow the trend of the times and unite as far as possible against the general public as do all other professions and industries.

Here is another example of the photographers' peculiar way of looking at things. In recent years there has sprung up in different parts of the country educational institutions whose aim it is to fit men and women for photography as a calling by educating them both theoretically and practically. Here, undoubtedly, lies the germ which may be developed so that it will introduce photography among the professions —in fact, not merely in name. But I find the average photographer, instead of welcoming this ray of light, assumes a decidedly hostile attitude, and never hesitates to belittle its importance. Such conduct is simply incomprehensible to me, and yet at the same time the only remedy that is definitely proposed by the leaders in our associations for all the ills that afflict the business photographer is to confer on him some degree which he has not justly earned by scholastic training and is not entitled to by practical attainments.

A December Night. K. Theodore Krautz.

THE DAY IS DONE. W. H. PORTERFIELD.

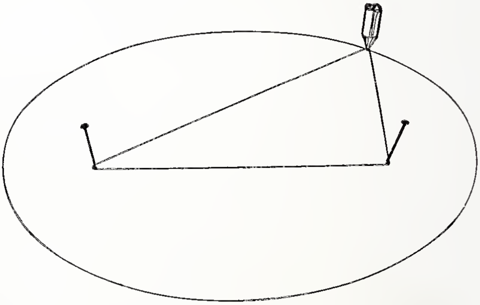
# How to Make Ovals.

*By H. M. Gassman.*

W. S. Cline.

AMATEURS, as a rule, have a greater variety of prints to mount than the professional photographer. This means that in all probability there will be occasionally a print that will look as well as an oval. To possess a large assortment of oval templates for such an occasion would be ideal, but not real, when the cost is considered. The next best thing is to find some inexpensive method of making up temporary templates. The writer has had at his disposal an infinite variety of ovals to fit any and all kinds of subjects. They can easily be made of any size and shape from suitable paper by means of a pencil, string, and two pins.

An oval is usually nothing more than an ellipse, which is constructed as shown in the illustration.



Place the paper on a piece of soft wood and insert the two pins securely. A cord or a silk thread, a little longer than required to loop over these two pins, is used as a guide to limit the path of the pencil as it is moved around the pins. A little notch made near the point of the pencil will facilitate holding the thread on the pencil point. A fine wire may be used if the stretching of the cord or thread makes trouble.

If the loop be made shorter or the pins be placed farther apart the oval will be elongated and more pointed at the ends, and conversely. A few trials will show that an oval of almost any desired shape can be accurately drawn in this way.

From this outline the oval can be cut out by a sharp penknife if the outside of the oval be desired, or by scissors if only the inside template be wanted. In the latter case use a pair of long scissors and cut along the outline steadily and continuously.

To determine whether the inside template is symmetrical or not, fold the oval lengthwise along a line drawn through the pin-holes. Then trim the double edge until symmetrical. Another test for accuracy is to place the oval on paper, inserting the two pins in the same holes, and then trace the edge by a pencil. Then reverse it, end for end, and trace again with pins in the same holes. After turning the oval face over repeat this same process. If the four outlines do not coincide closely the oval is not accurate, but an accurate one may be obtained by trimming the latter outline along the outside or inside edge.

Either the inside or outside template may be used to determine whether it is suitable for the print by holding the print and oval up to the light and moving the two relatively until the best effect is obtained. Then with a pencil make an outline on the back or face of the print and trim accordingly. A little practice will soon make one expert at making ovals, which are exclusive in their shape and infinite in their variety.

When mounts with countersunk ovals are used, a template can be made by placing over the oval a piece of letter paper and rubbing in the impression of the outline by the finger on which a little dust from a lead pencil is rubbed. Then trim a trifle smaller than the impression, as a dry print will swell larger in dimensions when the moisture of the mounting paste is absorbed by the print.

The template will be very satisfactory if made of cover paper, or even heavy letter paper. A more permanent template could be made from thin sheet "tin" or aluminum in the same way.

AT THE EDGE OF THE FOREST. THEODORE EITEL.

# Advice to Amateurs: For the Beginner.

*By Charles E. Fairman.*

WHEN life seems generally dull and colorless, and when even the alluring advertisements of the bargain counters on Friday fail to interest and excite, one can always find plenty of healthy amusement by reading over the "Advice to Amateurs" or the "For the Beginner" section of almost any photographic magazine, and after a careful reading and an attempt to properly digest the ill-assorted advice, one is led to wonder how it is that the amateur ever happens to arrive, unless he comes in spite of the advice which has been showered upon his pathway.

As an illustration, I wish to call attention to some instructions in a very recent number of a photographic publication. I do not call attention to this as a proof that this particular periodical is worse than others, for I think that all have sinned ; some, however, may be greater sinners than others.

Now for the instructions:

"How to make our solutions: Ten per cent. solutions are the easiest to use. There is a lot of quibbling as to what a 10 per cent. solution is, but you may take it that it practically means 1 grain of solid in 10 minims of liquid, and you won't be far out."

"Now we will start and make a 10 per cent. solution of pyro. Get an ounce bottle of it; don't trouble to weigh it; the ounce bottle contains 437.5 grains. We next want the preservative (sulphite of soda), weigh out four ounces of this and add to it 7 ounces of warm distilled water and 30 grains of citric acid. Shake well in a closed bottle, and when it has all dissolved, or nearly all dissolved, open your bottle of pyro, pour in the sulphite solution, give it a shake, and put it into a measure and add enough water to make it measure 437.5, 10 min.—that is, 4.375 min. or 9 ounces 55 min., or practically 9 fluid ounces. Label this 'Pyro.' Ten min. contains 1 grain pyro."

This is part of the formula for making a pyro developer, which the writer affirms is in proper proportion and makes a really fine developer. We may at once, if we take this formula literally, commence to search for an ounce bottle of pyro. I have never found it for sale in this form in the United States, but have purchased it in bottles containing an ounce in Canada. We may, therefore, conclude that an ounce of pyro, whether in bottle or in can, will answer the requirements of this formula.

There is another queer thing about the compounding of this pyro solution, for we are advised to dissolve 4 ounces of sulphite of soda in 7 ounces of warm water. Have you ever tried this experiment? It may be possible, and it probably is, for we have it in print, but as I find that it takes a sufficient length of time to dissolve 4 ounces of sulphite of soda in 16 ounces of hot water, not warm water, I can willingly forego the pleasure suggested in the words of the formula, "shake well." Life is too brief to employ its precious moments in an attempt to dissolve 4 ounces of sulphite of soda in 7 ounces of *warm* water.

But the remaining part of the formula, which describes the compounding of a carbonate of soda solution into a 10 per cent. solution, is also worth the while. I shall not describe fully this operation as it would involve too much space, but, briefly stated, the 10 per cent. carbonate of soda solution contains 1 ounce of carbonate of soda, 4 ounces of sulphite of soda dissolved in 9 ounces 55 min. of distilled water. This is supposed to be a 10 per cent. solution of carbonate of soda, and no allowance has been made for the space occupied by the dissolving of 5 ounces of crystals in 9 ounces of water.

When we arrive at the "To Develop" stage of this formula we find other items of interest, we compound the developer as follows:

| | |
|---|---|
| Pyro solution.......................... | 30 minims |
| Soda solution.................... | 240 minims, or ½ ounce |
| Water to make............................ | 1 fluid " |

THE HAPPY HOUR
J. Ellsworth Gross

If the amateur or the beginner uses this formula and only uses 1 ounce of the developing solution, he will be using a developer which contains 3 grains of pyro to the ounce of solution, a quantity which to some very clever dark-room men seems unusually large. Again, if he wishes to develop one 6½ x 8½ plate or an 8 x 10 plate, or two 5 x 7 plates, he will need to use at least about 6 ounces of developing solution in order to work comfortably, and if he is doing large work, like 8 x 10 plates, he will use all of the soda solution in the development of three plates, and then there arises the task of again dissolving 5 ounces of crystals in 9 ounces of water. It will be good exercise, and the beginner will fully understand what is meant by "shake well."

I have found from an experience covering several years, in which the larger part of my dark-room work has been done with pyro, that the most convenient form in which to use pyro is to use it dry. I make my sulphite of soda solution in the proportion of 1 ounce of sulphite of soda to 4 ounces of water. I keep this solution tightly corked in 4 ounce bottles. My carbonate of soda solution I make in the same proportion, and if carbonate suffers from being made in large quantities I have never discovered it. For a developer for a properly exposed plate I use the following proportions:

| | |
|---|---|
| Sulphite of soda solution... .... ..... ...... | ½ ounce |
| Carbonate of soda solution...................... | 2 drams |
| Pyro.............................. ........... | 5 grains |

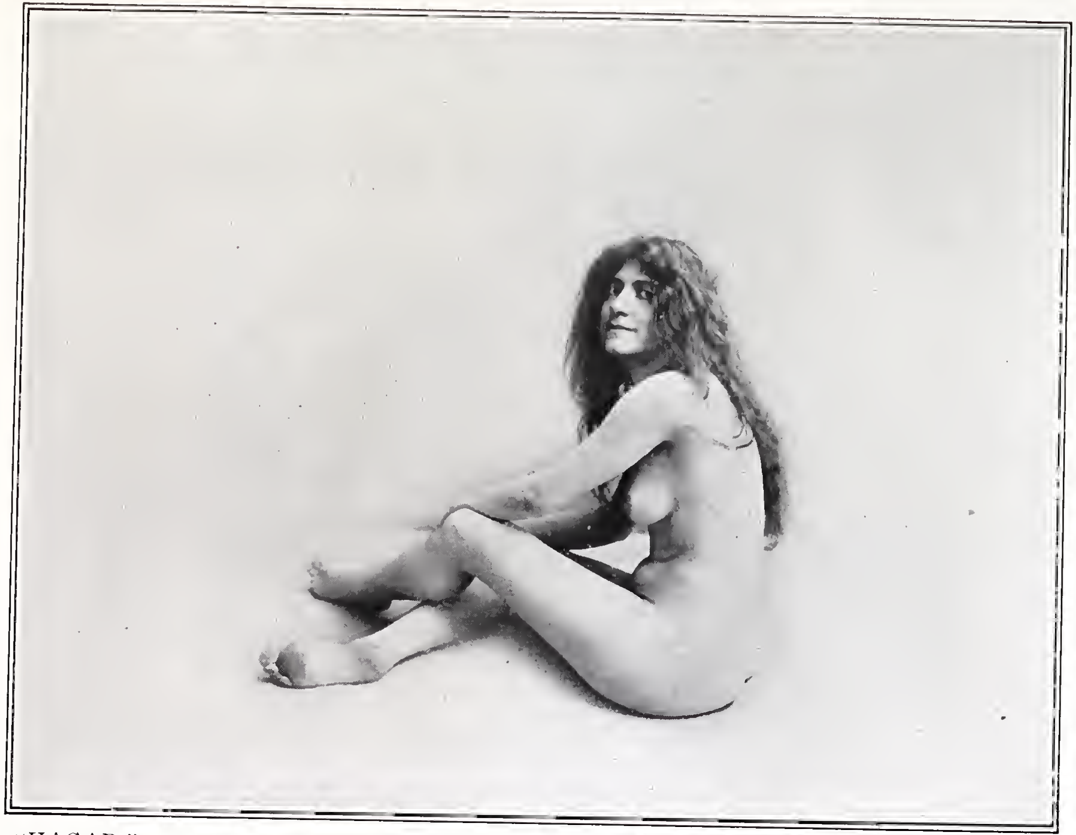
Water to make 5 ounces if in winter, or 6 ounces in the summer.

I find that this formula works well, and that if a little more density is needed more pyro can be added after the detail is fully developed Many subjects will have plenty of density with this amount of pyro.

Development carefully considered means a sufficient amount of detail plus sufficient density. It is apparent that we must have the detail first, the density later on; hence the value of working with a developer which will not give density until we are sure that all necessary detail has been obtained.

But the author of the formula quoted has asserted that his formula is a good one, and I am not at all disposed to dispute him. What I wish to state is, that different workers have different formulæ, and seem to have equally good results. This goes to prove that there is vastly more latitude in development than is sometimes imagined, and that the conditions of the temperature of the dark-room, the plate used, and the individual estimate of the worker as to what constitutes a properly developed plate, are factors which we are apt to forget when we calculate over the proportions of a formula that we have never used. I think that, after all, that the developer which is subject to the control of the particular worker, and by which he can modify the development to suit the needs of the different subjects within the province of photography, is one that he should be convinced is not giving him all that he is seeking for before he makes a change to some later formula.

THE HOUND OF THE BASKERVILLES. James D. Radcliffe.



"HAGAR."

Richard Trotter Jeffcott.

# Indexing Negatives.

*By J. A. Anderson.*

WITH a few negatives put away in envelopes and suitably marked, it does not require much hunting to find any one wanted, but as the number grows to hundreds or thousands, some other method is needed.

This cannot be better found than in the Card Index system used in libraries and many business establishments.

The fundamental features of this system are the following :

1st. A name and number for each thing to be indexed.

2d. A list of these in numerical order, termed in libraries the "Accession List."

3d. A series of cards of uniform size, set up edgewise in a box or drawer, having on them the numbers and titles, and arranged in alphabetical order, with guide cards to aid in finding the different letters or divisions.

The methods of using this system are varied in accordance with requirements. The plan adopted by the writer for indexing some four thousand negatives will be here outlined.

Each negative has pasted on one corner, on the film side, a bit of adhesive paper on which its number is written in pencil. The numbers are consecutive in a single series, and are entered in an "accession" book in consecutive order as the negatives are made, with such description as is desired. There are columns for date, locality, number of negative, title or other description or notes, and for the number and page of album where the print is eventually put.

The following is a condensed form for the book.

| DELAWARE RIVER. | | | |
|---|---|---|---|
| 575D | '95 | 10.27 | Bridge at Newville. |
| 627C | '95 | 11.5 | Malta Island. |
| 630D | '95 | 11.15 | Water Gap. |
| 650D | '95 | 11.40 | Welles Falls. |

The negatives are then put away in plate boxes, which are set up on shelves. The boxes are numbered consecutively for convenience in finding the place of any taken down, and on the end of each is a list of the numbers of the contained negatives.

An index is then made from the "accession" list by writing the number and other designation of each negative on a card, which is then set up in its proper place, with others, in a box or drawer.

The heading of the card is such as most suitably designates the negative or its class, and a more particular title or designation is given, if necessary, on the line on which the number stands.

In libraries it is usual to use a separate card for each book, but here, when there are several negatives that come conveniently under the same general heading, they are put on the same card, using a line for each. This saves cards and space and proves more convenient for reference than with a card for each. For instance, a number of views may be taken on, say, the Delaware River. The card bears the name of the river as its general title, and shows on the lines the numbers and particular descriptions of the negatives recorded.

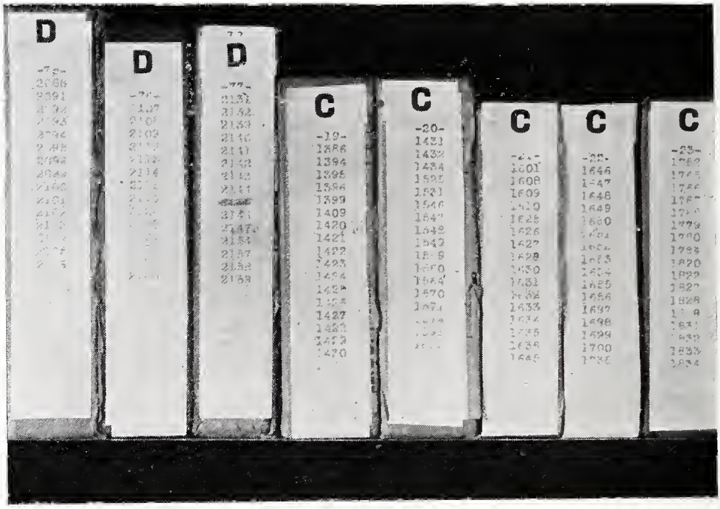
When such list takes more than one card bearing the same title the cards are numbered consecutively. Suitable cards are furnished by dealers in library supplies, ruled with horizontal lines and one or two columns.

In the columns are placed the numbers and dates, with a space after the latter for the album number and page, after which comes the title or special description.

The following shows the form of the card;

| 1905 | | | | |
|---|---|---|---|---|
| Date. | Locality. | Size. | Number. | Description. |
| | | | | |
| | | | | |

The selection of titles will sometimes tax one's ingenuity. Titles are often given to pictures when shown or given away, which mean nothing to anyone but the author of them, and would be of little value in an index. Thus "November" or "Spring" or "Sunset" might mean any one of a dozen views, or there may be several exposures on the same subject. The point, therefore, is to use such designation for a negative, as a person looking for it will be likely to think of, and it is sometimes well to "cross index," as it is termed, using different designations, so that if one is not thought of the other may be.



NEGATIVE BOXES ON SHELF. J. A. Anderson.

With the serial number on the negative of a landscape which requires the use of a sky negative, the number of the latter is noted, and the direction of the light in each is indicated by "Rt" or "Lt," to show whether the sky film is to be used film side up or otherwise.

In printing, the negative number is marked on the back of the paper as it is put in the frame, and again on the mount when the print is mounted, thus arranging for subsequent identification.

A special feature of the writer's collection is that there are five sizes of negatives, each size designated by a letter. Thus a box containing 4/5 negatives bears a large letter C above the list of numbers, while a 5/7 negative box has a D. The boxes bearing a given letter are numbered consecutively to aid in finding the place of a box which has been taken down. This is more convenient than depending on looking for the consecutive negative numbers, and it has been found handier to have the different sizes in blocks rather than mix them.

In the index, the negative number is followed by a letter indicating the box and therefore the size of the negative, as well as where it may be found. Thus 596D indicates that negative No. 596 is a 5/7 and that its number will be found on a D box.

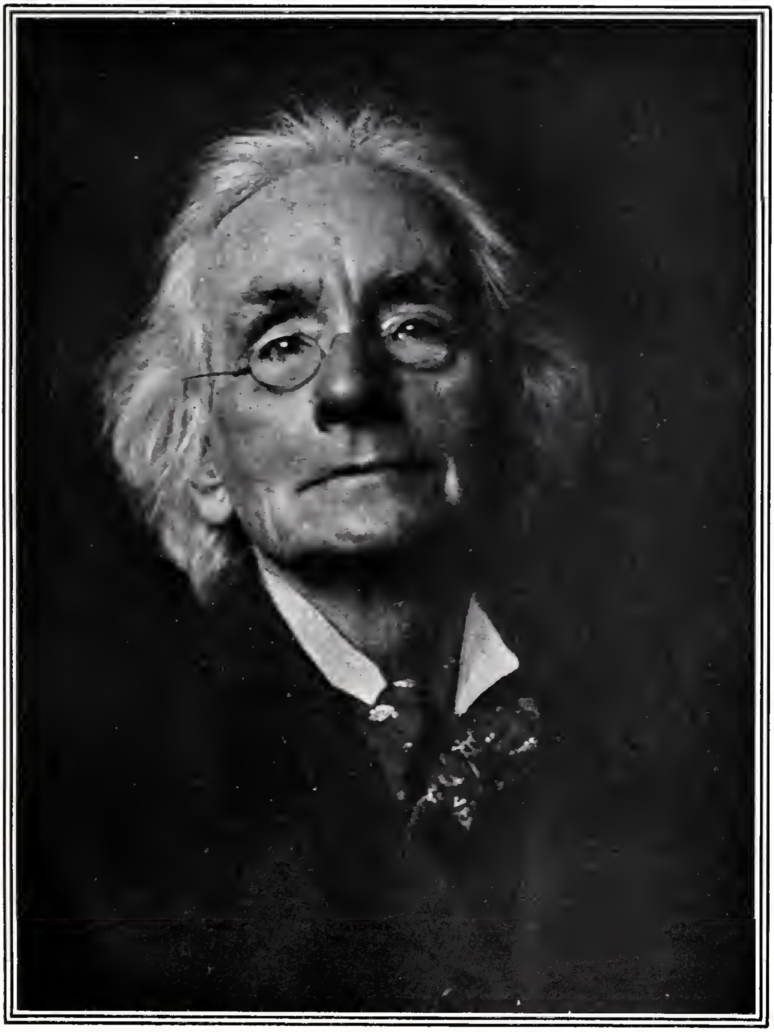
The numbers on the boxes are best made with a typewriter, using a temporary written label for a box not entirely filled. For the large letters go to the printer.

In the list of negatives there are several sets of special subjects, for which, for certain reasons, separate serial numbers were desirable. These are noted in a separate column in the "accession" list, and also on the negative with the general serial number.

Any one proposing to index a large number of negatives will find it best, after completing the "accession" list, to take off from it on slips the information to go on the cards, giving on each slip the proper heading for the card and the information respecting the negative, and then arrange the slips alphabetically. This brings together those which are to go on the same card, and saves much time that would be used in handling cards if it should be undertaken to write at once on them.

In a large number of negatives there will be some that will probably not be wanted after the first print, as well as some that may be thought worthless. After destroying any of the latter class, it is best to index all the others, as otherwise the record would not be complete. It may happen that it is difficult to find titles for all the negatives made on a summer outing or other trip, and that the indexing of every one is not specially important. In such case, make a card for the locality or trip and refer on it to the "accession" list.

U. S. Battle Ship "Kearsarge."
Wm. H. Schaefer,



AN OLD MAN. GEORGE DONEHOWER.

# Pictorial Photography.

*By J. Will Palmer.*

OUR worthy editor is asking us: "Where is your promised contribution for The Annual?" and it is not without some degree of diffidence that I rummage my old thot bucket for a subject. Nearly everything is so well covered now-a-days, and by the pens of those so much abler and better fitted for such work than mine, that I hesitate, and almost wish I had not promised an article. And then, again, I remember how many and many a time I have been helped through dark places by former contributors to The Annual, and I again scratch my head for a subject. If I could only say something that would help some one brother amateur—as I have been helped by some of the good souls who have written before me—it would be a pleasure not too often enjoyed. But what shall be the subject?

I think I will choose "Pictorial Photography," not that I know anything about this theme, but because I am so anxious to learn; and, if I may judge from the many specimens of work which it is my privilege to view from time to time, it is also the wish of many other photo enthusiasts to learn of this phase of photographic work, or at least ought to be.

Now, then, I am not so egotistical as to think I am going to say something that will be of benefit to all our readers, but possibly I may reach one; and I hope this may be the means of stirring up some of those more talented and better able to handle the subject, and that they may be provoked into writing, and that the next year's Annual will be made more valuable thereby.

First, then, what is "pictorial photography?" What does pictorial imply? ask every one of our readers, and how many would give the same definition? I have asked this question many times and have found that the masters differ, and if the masters, what could we expect of the students? Authorities on the English language say, "pictorial is 'that which goes to make up a picture," "that which is picturesque," "pertaining to pictures," etc. One class of photo artists say nothing is pictorial unless so sharp all over that one can count the blades of grass; another class tells us that in order to be pictorial a photograph must have nothing sharply defined, but all out of focus, fuzzy.

What is pictorial? What is picturesque? What is a picture? Why one will say, a picture—why, a picture is—is a painting; but is the painting always a picture? Are all paintings pictorial?

I think not.

Another class of photographers seem to take the modern poster for their ideal of the "pictorial," and everything is done in solid masses of deep shadow and intense high-light; two tones only, or possibly one or two half-tones. The high-lights as white as the paper on which it is printed, and the shadows as dark as the process is capable of. Another class believes in what they are pleased to call "low tones," and they represent everything in as near one tone as is possible to make them; no high-lights, no deep shadow—all halftone.

Still another class keep their high-lights very small in area, and just a shade lower in tone than the paper on which it is printed; the darkest shadows (also small in area) and just a bit lighter than the deepest dark the process is capable of, and strive to obtain as many gradations of tone between these extremes as possible. And as far as definition is concerned, they use the focus of the lens to carry prominence to the leading feature of the composition—this is in the sharpest focus, everything else subservient to it, or, in other words, a little less sharply defined. In the lighting, the same idea is carried out, strongest light where it will accent the *motif* of the picture, everything else less strongly lighted; and as the eye wanders from the principal object, the lighting fades away almost imperceptibly, and never to deepest shadow.

The class of workers last mentioned, so far as photographic technique goes, have, I believe, the correct idea of pictorial photography. There are times when all the others can be used to advantage; but for all classes of subjects, a negative made and developed along the lines of the latter cult will be capable of producing a print that will be passed as "pictorial" by any Salon jury in the world, providing everything else is in harmony.

Now, then, all I have said thus far has been simply in relation to the technique of "pictorial photography." There are other things even more important, perhaps, and these things we will take up under different heads, the first of which we will call composition; and this might be subdivided profitably under still other heads, but we must be brief and merely outline some points to be borne in mind by the student and pass on to the next subject.

Composition begins before the camera is introduced into the scene, and it ends the second the exposure is made. Do not fail to remember that. Do not, then, expose a plate until the subject matter, as revealed to you on the ground glass, is as near perfect as possible for you to make it. Watch carefully for those little obtrusive things which are sure to mar the finished picture, and, if impossible to avoid them in any other way, give up the whole thing, and look for something better. There is no law to compel you to expose a plate on what does not suit you, and the old and foolish excuse, "Well, it was there and I could not move it," does not count with the pictorial photographer.

Never include in your composition anything not in harmony with the *motif* of the picture; for instance, do not start out with "A Milk Maid" for your *motif*, and choose a city girl in riding habit with a milking stool in one hand and a slop pail in the other, and a yoke of oxen in the background. Do not attempt a "genre" subject until you are familiar with every detail of the theme in hand; some one will notice your ignorance, and you will be the loser in the end. I could cite scores of instances in illustration of this point; in fact, we seldom see a collection of photographs but what some of them are utterly spoiled by this ignorance of the subject in hand. No matter how much we may know of "art principles," "art rules," "technique," etc., they count for nothing if there is something included in your composition which is not in keeping with the subject. I once heard of an artist who had labored for months painting a pastoral scene in which a group of cattle were depicted; the work was finally completed, and was considered his masterpiece, and placed on exhibition in one of our largest cities. Crowds of people visited it, and were loud in its praise. At last a farmer joined the crowd and attended the exhibition, and the first thing he did was to exclaim ·

"Who in thunder ever saw a cow get up on her for'ad feet fust!"

The artist had painted a cow in the act of getting upon her feet from a reclining position by raising herself up on her forward legs first. something a cow probably was never known to do; but it took an old farmer to teach the artist the fact.

Only a few more words and we will leave composition. Seek simplicity; tell your story with as little material as possible. Court unity; never have but one point of view, and never two prominent objects in the picture plane without the one being made subordinate to the other in some manner, however slight.

I will next speak of "Aerial Perspective or Differentiation of Planes." A number of men dressed in black, standing side by side in front of the camera all in the same plane, should photograph in very nearly the same tone value. Place the men, say twenty feet apart, and each man that much farther from the camera than the one next to him, and there should be a perceptible difference in tone values between every two men in the finished print. Why? Because there is twenty feet more atmosphere between the second man and the eye, or the lens, than there is with the first one, etc. What makes the sky blue?

The above is, of course, an extreme case, but the principle is always the same, and is what is called "differentiation of planes," "aerial perspective" or "atmosphere," and should never be lost sight of in pictorial work.

Next we will touch upon the subject of "Tone Values" and "Texture:" In a general way these have to the photographic artist a similar meaning, inasmuch as correct treatment for the one is pretty sure to produce the other at the same time. Returning to our men dressed in black once more, we know the clothing is pure black, and yet it never appears to be black to the eye—always some shade of grey, except, perhaps, in the deepest shadows. And this is the way it should be represented in the photograph if we are working for the pictorial. And at the same the white collar and cuffs—we know they are white—but if we examine them critically we shall find there is a very small portion of them that appears pure white to the eye (if properly lighted, and that is what we are considering to be the case), they, too, are simply grey, but in several different tones, and of course much higher up the scale toward white than the coat. Perhaps the shadows in the collar and cuffs will compare with the highest light in the coat. Then, again, there is the flesh; its general tone should usually be neither so light as the linen nor so dark as the coat. Another study in greys, and a study well worth our while.

This example is a very simple one, and we hope will make plain our interpretation of "Values" or "Tone Values." Every subject, no matter how simple or how complex it may be, is influenced by this quality, and the sooner the amateur realizes the true worth of it the more rapid progress he will make.

But what of "Texture?" Well, I will try and explain. We have said that the shadows in the collar and cuffs of our man dressed in black were perhaps the same tone value as the high-light in the coat; and we might have added that there probably would be tone values common to the coat, flesh, collar and cuffs. And if a small portion were cut from the finished print—one from that part representing the the coat, one from the flesh, and one from the linen, of the same tone value, we could not tell which was flesh, which was coat, or which collar and cuffs, were it not for the other quality—"Texture."

This is a point often lost sight of in pictorial work, and it is, perhaps, of less importance than some others; but it is well worth while to study it, and to note how often it will be seen in work we most admire.

I think we will stop here. We are well aware we have only touched upon those subjects we have taken up, and that there are many more we might have taken up which we have not touched upon at all. We have not attempted to tell you how to obtain these results, for it is harder to learn to know these qualities when you see them than to produce them when you know them. And an article of this kind should never be too exhaustive. I am afraid this will be too much so, but we hope our editor will forgive me this time.

MISTLETOE. Belle Johnson.

A FLOWER ARRANGEMENT. J. M. WHITEHEAD.

A WINTER MORNING

Rudolph Eickemeyer, Jr.

# A Summer Outing.

By E. S. Kibbe.

IT is sometimes necessary for photographers, as well as ordinary mortals, to get out for a week or so and get a little fresh air and an appetite. Seven days every week (as most of us are obliged to work) the year round, is too much for the best of us, and we are sure to feel the effects of it.

Of course, there *are* some who cannot possibly get away, as they cannot shut up their galleries and have no one they can leave in charge.

Others who could leave their place in charge of an assistant for a short time, do not feel that they can afford the money necessary for a trip.

Now, if such a person would purchase a tent (the size would depend on the lens they intend to use) take an 8 x 10 view camera ; for compactness in transportation use a portrait lens; take a couple of 8 x 15 grounds, a head ground or two, a few folding chairs, a drapery or two, and your outfit is practically complete.

For a dark-room I have had the best success with one made out of matched ceiling, made in four sections, hooking it together at corners with screen door hooks, and another section fitting in the top, supported by cleats across the ends of side sections; sink the bottom into the ground about an inch, and if it is carefully made it will be perfectly light-tight.

You can either take a finishing outfit or send the work to the gallery to be finished after showing proofs (the latter I consider preferable). Go to some lake or small place where there is a quiet summer resort, *not* to a large fashionable place, and you will be surprised at the amount of business that can be done. In the morning and evening you can go out fishing or boating, take a cot and sleep in the tent, and you will come back wonderfully improved in health and appetite, besides having a neat cash balance above your expenses.

Some will say: "But it is impossible to do good work in a tent, and I do not care to send out poor work with my name attached."

I have proved by experience that good work *can* be done in a tent. If you will line the opposite side from the sunlight with black calico from the ridge pole to the side of the tent, and from there to the ground, and about 15 feet in length, then cover the skylight opening with cheese-cloth, you can get *good* portrait lighting very easily.

If you try this once you will go again at the first opportunity.

"HOOT MON." Belle Johnson.

A MODERN MADONNA. Mrs. W. W. Pearce.

# An Instantaneous Shutter. **By George Rettig.**

George Alexander.

DID you ever have an accident happen to your shutter when you really needed it for instantaneous work, and you were miles away from anyone who could repair it?

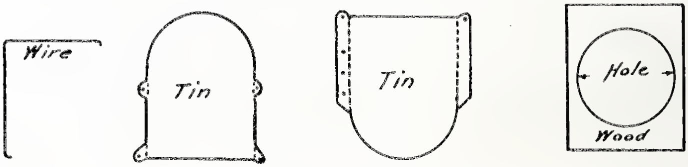
Here is a way to make a good substitute if you ever do have an accident, and this one will not get out of order very easily.

You will require a thin piece of wood with a circular hole in it to fit over your lens; two pieces of tin cut as shown on the drawing—the projecting pieces being bent up along the dotted lines; a piece of wire with a little "spring" to it and four small nails. Pieces of cigar box may be used if you can not get the tin, but the shutter will not fold up so well. You can not buy one that will occupy less space when folded—one for a lens with 2¼ inch diameter, being 3¼ x 2½ x ½ when folded.

Fig. 3 shows the shutter arranged for focusing; Fig. 1, shows it set ready for making an exposure. The wing "B" is pushed away from the lens, and "A" falls down, covering the lens again. The speed is regulated by inserting the wire in the different holes along the side of "B."

Fig. 2 shows the shutter folded.

There will be less danger of light leaking through, if the different parts have black cloth glued on them.



*Articles Required*

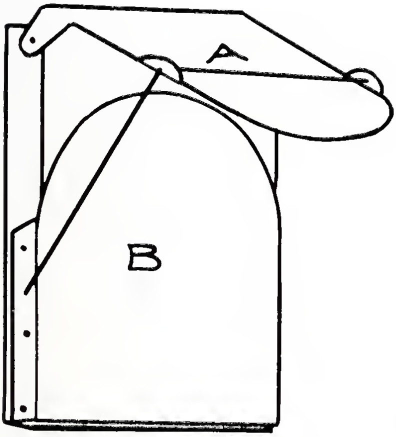


FIG. 1
(Set.)

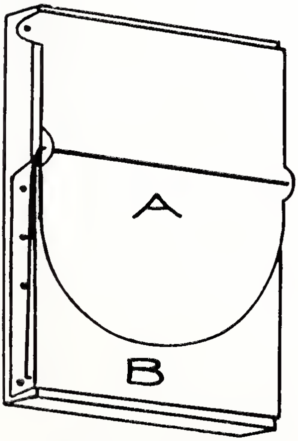


FIG. 2
(Folded)

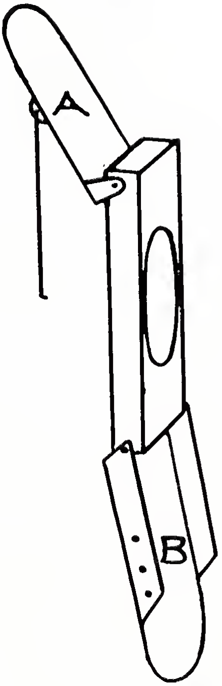


FIG. 3
(Focusing)

THE LAST TREE. THOMAS A. MORGAN.

# The Whys and Wherefores.

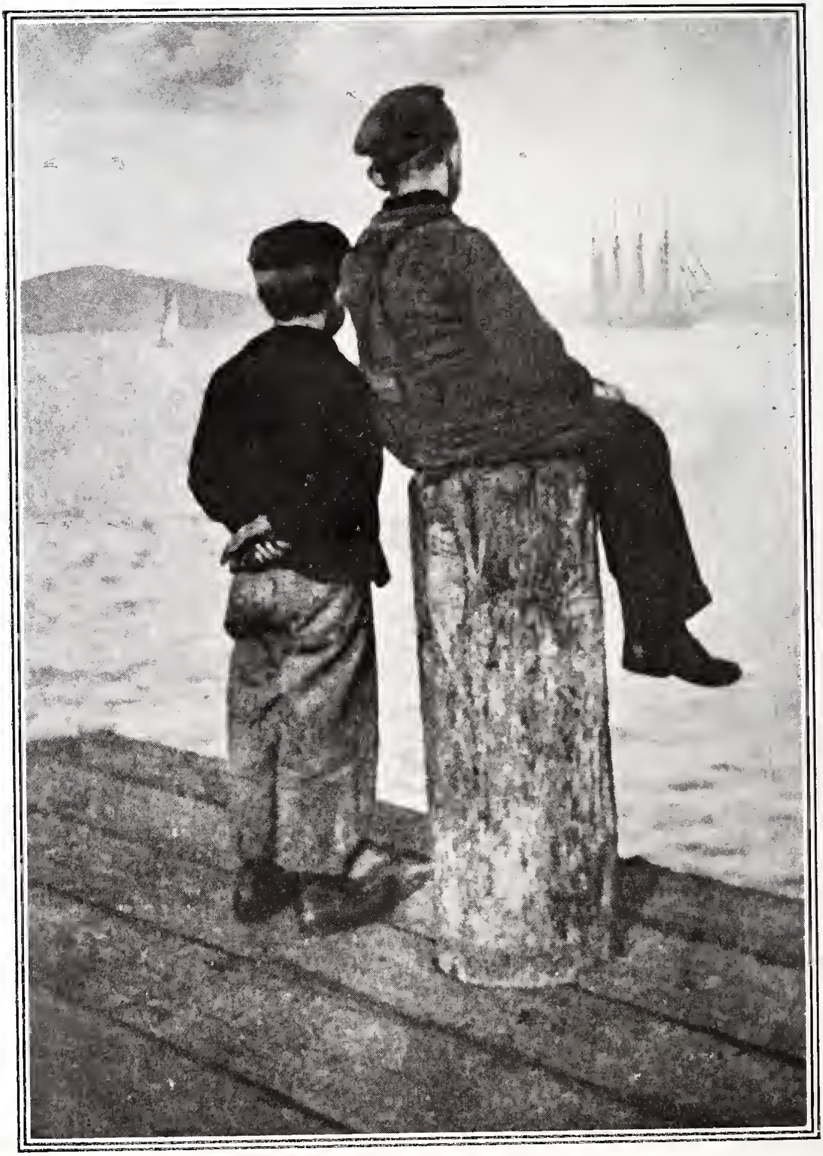
### *By Felix Raymer.*

THE editor of THE ANNUAL, having asked me to send a short article on something pertaining to photography, I have decided to take for my subject the above title. I am asked every day of my life why it is that I do such and such a thing in a certain way and why some other way would not be as good or better.

As all know who know me at all my specialty has been for a number of years that of lighting and posing. It has been my pleasure to have handled all classes of lights during that time, and I suppose I have been benefited in the way of learning how to do things, and do them the same at all times. It is a fact that cannot be denied, the average operator will be unable to make two sittings the same under the same conditions. He will claim that the light is not the same, or that the plates were slower, or that the developer was not working as usual, or some reason for his inability to handle the subjects the same. This is, as a usual thing, the result of ignorance on his part of the way in which to control his light. He often says it is so constructed that he cannot control it. He fails to learn that the light he has to handle is that part of the light that enters the room and that he has nothing to do with that which does not get in. If there is a part of that light that is not giving the results that he wishes, he should cut out that part, and the way to do that is to have the light so curtained that certain parts of it will be curtained off, and in this way it will never get into the room, and if it is not in the room, certainly he will not be bothered with it.

We have all of us had it told us, to work our light so that it would fall on the face of the subject at about an angle of 45 degrees, and as soon as the instruction was given us we would forget it, or at least never ask why it should fall at that angle and at no other. There must be a reason for this or the instructions would not have been given. Some one has found that at a certain angle of light certain things have been obtained that could not be secured at any other angle. Now, the thing we want to know is *why* is that angle better for certain things, and *what* are those things that it is better for?

The portrait photographer desires above all to get a good likeness of his subject, for it is upon this that his living depends. It does not matter how homely the subject is, there must be a certain likeness to her or him or the money for that job will not be forthcoming. At the same time, to get that likeness there are certain other things necessary, and they are roundness, vigor, action and composition. To get roundness we will have to handle the light in such a way that the head will show that it is round. Now, why do we want the head to appear round? Simply for the reason that it is round. It certainly is not square. It represents a round object nearer than any other, and for that reason we will have to make it round. This is done on the part of the operator by his handling the light as he should. We can take a ball and make it look flat, although we know it is round. This is done by the manipulation of the light in such a way that it falls on the ball from a direction that prevents its roundness showing. Thus it is with the head of the subject; it is round, and if we fail to show it we will have it showing in a way that is not true to nature. This roundness of the head is controlled entirely by the amount of light we have falling on the front or back of the subject. If the light all falls from the front there will be a surfeit of light, and the result will be a flat, broad field covering the entire head, making it look as though it had been pasted against a wall. The only practical way for finding this out is to take a subject and throw all the light directly in the face of him, and the result can easily be seen. The more light we have in front of the subject the broader the effect, and, as a consequence, the less roundness after the central point is passed from the rear position to the front. The more light we have falling on the rear of the subject



LOOKING FORWARD

Herman S. Hoyt

the more contrast, until after the central position from the front to the back is passed, and then again we have flatness from a superabundance of shade.

There is a half-way point that will suit all subjects, and when that point is reached there will be perfect roundness and a good likeness if every other consideration has been met. The question of amount of light falling on the front of the subject is controlled by the facing of the suject away or to the light. The farther from the light the subject is facing the less light there will be on the front of the face. Of course, the farther to the light he is facing the more light there will be on the front of the face.

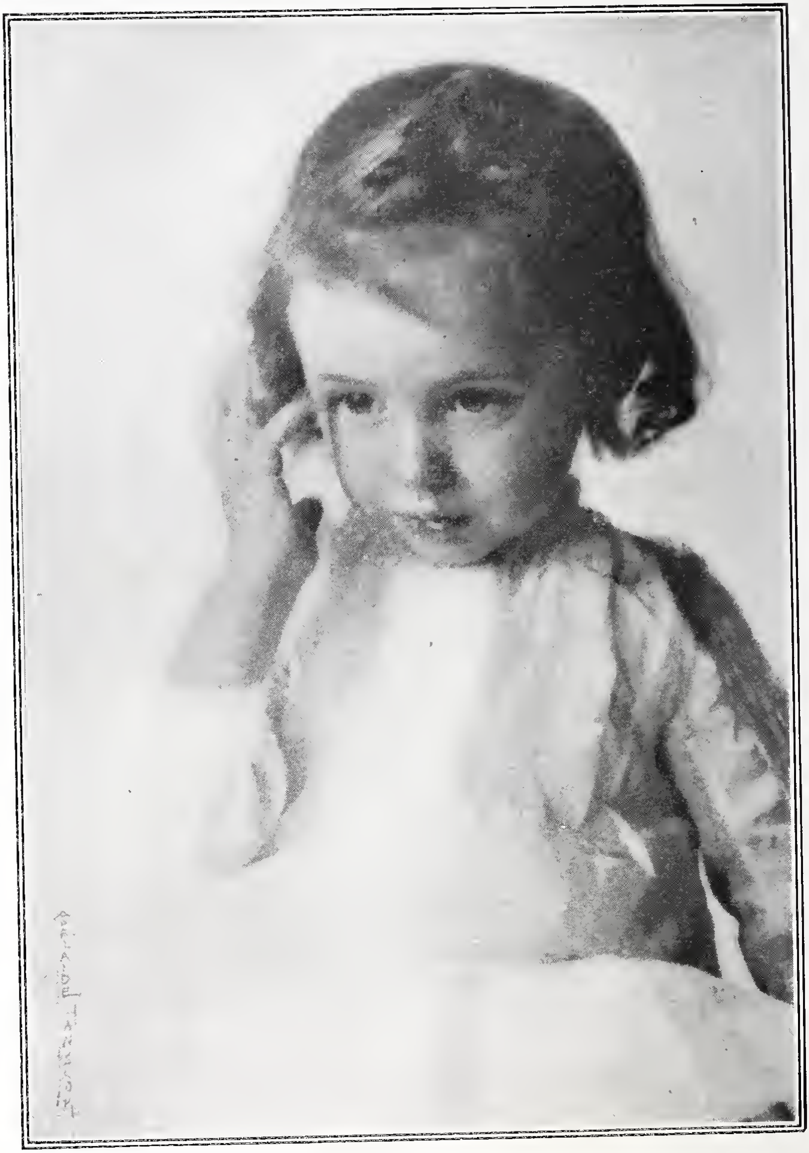
Now, the half-way point is where there is just enough light falling on the front of the subject to have the light on one side of the face and the shadow on the other side with a little life in the eye of the shadow side. To get this the subject should be turned from the light until it has just left the ear on the shadow side of the face. Here stop, as to go farther would be to pass the half-way point, and the result would be to have one side of the face in too deep a light and the other side in too deep a shadow. If this was the case, there would be an exaggeration of character or the exaggeration of the wrinkle and lines of the face, which would be anything but pleasing to the subject. It would also destroy the idea of roundness, for the reason stated above, that there would be a flatness owing to too much of the face being in shadow.

Next we come to life and action in the picture, which is one of the most important considerations in the making of portraits. This is controlled by the direction the light takes in falling through the opening of the skylight itself. If that direction is at the angle of 45 degrees we will have the action and life, but if it is not, there will be other things that go to destroy the making of the best work. For example, if the light falls below the angle of 45 degrees we will have the lower part of the face illuminated too highly, which would cause that part of the face to come up as rapidly in the developing as the upper part, and it is known that the best work shows a decidedly stronger light at the top than at the bottom. Now comes the *why* for this. The reason we want a stronger light at the top is that we look at things with the light falling on them from above. The sun is above us and we get our light from him, and we are in the habit of seeing all the world lighted in that way, and naturally we expect to see things we make lighted in the same way, for we are to follow nature as near as we can in making our pictures if we are to please nature.

If the light falls on the subject from an angle higher than the 45 degrees, we will have a hollow-cheeked, hollow-eyed individual that will have the look of a half-starved being. This we know will never do. The light falling from directly above the subject will produce this effect owing to the heavy shadows under the eyes and in the cheeks. While we say that the light of nature all comes from above, we do not mean that it comes from directly over us, for we never see the sun directly above. It is always at an angle from the centre, and so we will have to skylight our subjects under the light.

There is another consideration in arranging the light on the subject's face, and that is the matter of lines that go to make up character as we see it in the face. If there are more of the horizontal lines running through the face than there are of the perpendicular, we will have to arrange the light so that these lines will show, if they do not, we will have destroyed the very lines that go to make the likeness of the subject, and that was one of the main things we had to get in the portrait. Therefore, if we have too much top light falling on a face that has a majority of horizontal lines running through it, we will have made the man look older by reason of the fact that the top light will exaggerate the lines. If, on the other hand, we have too much side light falling on such a face, we will have buried the face in light and given a weak appearance to it owing to our having taken out too many of the fine lines that go to make up character. Again, if we have a face in which the perpendicular lines predominate, we will have to be careful about using too much or too low a light, or the character will be exaggerated, or we will have to be careful about using too much of the top light or we will have destroyed all of the fine lines of the face, which will, of course, destroy character. Thus we come back to the original point, and that was to use the light falling on the subject from a point half-way between these two extremes, or the angle of 45 degrees. We cannot make a good round portrait effect from any other source, and so that is *the why and the wherefore* of this article.

DASIES. George Alexander.



THE DREAMER. ADELAIDE HANSCOM.

# Photographing Children.

### By John Boyd.

IF a vote of the people of the world could be taken as to what subjects they thought would take the most pleasing pictures, there is little doubt but that those connected with child-life would win by an overwhelming majority.

There is no use attempting to explain why this is so, for every one knows that the winning ways of childhood appeals to all classes, from the comdemned criminal in his cell to the profound and learned judge on the bench; from the humblest laborer in his cottage to the sovereign in his palace, whilst to the feminine heart the child and its ways blend into a magic affection which is past finding out.

The camera is such a valuable aid in the preservation of many of the cute acts of childhood that fortunate is the man or woman who can excel in picturing these doings; whose results will stand out as models of roguish grace, free from every suggestion of pose and replete with all the charms and illusions that give to life its happiest hours.

Of course, to be successful in any branch of photography one must know its ins and outs, but in none will the love of the subject be more apparent than when picturing children.

Fortunately the love of children is a very natural one, but it shows itself in some more than others.

Take the average matter of fact professional. He is the father of several children, and loves them with all the ardor of a parent, then why does he not make successful pictures of the little strangers who visit him in his studio? Simply because he has not the knack of "making friends" with them. He treats them as business patrons, which they quickly resent by "balking" in a manner highly obnoxious to the man behind the camera.

We want and must have pictures of children as they appear in daily life, hence it looks to me as if the attainment is to be brought about by the amateur rather than by the professional.

The more I see and practice child-work the greater need I feel for cutting loose from the ideas usually promulgated for the picturing of maturer individuals. With these a definite idea of composition is necessary—that is, you formulate an idea, you think out its details, plan its harmonious arrangement, and get the whole thing in your mind before attempting its execution.

A Trolley Car Ride.

Were you to do this with groups of children, there is just the slimmest chance of your getting anything like what you had in your mind's eye, for the child that can pose without imparting a "posy" appearance is rare indeed; but if you release it from restraint and give it free rein, it will, unconsciously, assume some of the prettiest positions imaginable.

The most successful work that we see to-day is not really the result of a worked-out plan, but rather that secured by the vigilant and skilled camerist who has had the confidence of his or her subjects and got them to act on suggestions.

You have but to suggest to children that they "make believe" playing store, out for a street car ride, or any other form of amusement, and they will at once give you pictures in plenty, but try and place or "plant" them where you think they ought to be in while engaged in such occupations, and I venture to say you will rue your job.

Children are most susceptible to influences of all kinds, and rarely forget first impressions. We must, therefore, train ourselves to forget their faults and accept their graces and forever practice the happy knack of quickly winning their affection, no matter under what circumstances we may meet them, so that when we seek their images, camera in hand, we may be able to put them immediately at their ease. This accomplished, the rest is merely a matter of skill and patience. The freedom with which children enjoy out of doors is a very important factor in the picture makers favor, and if the operator is not able to obtain a successful negative of his little subjects when engaged in their everyday play, it must because he has not the quickness of intuition necessary for this class of work.

Playing Store.

The variety of subjects which will suggest themselves around the home to the one who is anxious to record them is not nearly as great as the little ones will devise when busy in their own familiar world, and it is there we ought to picture them.

If you were to attempt to transplant these to the studio, the play would cease, the childish graces disappear, and in their place would grow frowns, pouts, and all the other infantile freaks that can be practiced to try the patience of him who has not learned to win their confidence from the first.

This is the secret of successful picture-making with children. Leave them untrammeled in their play, and you can work *ad libitum*, but let them be asked to do that which you want them to do, and the chances are the naturalness of expression will fade away as the mists before the morning sun.

The question of background and accessories may appear to be a dominant one, but they should never stand in the way of making an exposure. This is stated on the broad ground that, where you find children at play, you may be sure that they are in their natural surroundings. There are, however, places where a little doctoring will be a benefit, and if blocking out, vignetting, double printing, or any of the other devices will produce a better result, it would be quite legitimate to practice them.

THE ORCHARD NAVIGATOR.

The literature now-a-days obtainable on these subjects will point the way, and no trouble is too great to bring about a perfectly satisfactory picture.

I am not optimistic enough to say that every one can make a success with children, but will venture the assertion that he who tries faithfully along reasonable lines will broaden his views on the subject, and eventually benefit himself by forming habits of patience, observation, quickness of perception, and last, but not least, an increasing respect for all those who come within the range of his camera.

* * *

LITTLE SISTER. HANA ROBINSON.

# An Interesting Problem in Photography.

### *By Albert Gleaves.*

IT is related of a famous magician that, in order to cultivate and develop his son's faculties of observation, he would run him rapidly past shop windows and then catechize him upon what he saw until the boy soon acquired his father's keen sight, and learned also to enumerate all the wares exposed to view in a brief glance.

Perhaps the photographer has not as much need as the wizard of an especially marked sense of observation, but it certainly goes a long way toward helping him in his profession in more ways than one.

Do you think that, given a photograph of an ordinary building, you could tell from the shadows not only the date—and by the date I mean the year, month, day, hour and minute—that the picture was taken, but also the position of the camera with reference to the building? This at first sight seems impossible; but the problem has been cleverly solved by Dr. Rigge, S. J., in his examination of a photograph of the Creighton Observatory, in Kansas, and while, of course, the solution requires a knowledge of mathematics, it is a simple thing, and I am inclined to think that Prof. Rigge could never have arrived at his clever conclusions unless he was a remarkably close observer. Let us see how he did it.

The photograph shows the conventional observatory, with dome, transit room, etc. There is no background visible, and a grass plot extends in front of the building. Now, as to the first part of the problem, that is the date. Any one will observe from the strong shadows in the picture that the sun at the time was shining brightly, and it is evident, also, that the length of the shadow, in a measure.

indicates the height of the sun in the heavens. The profusion of grass likewise points to spring or summer. The problem mainly consists in the solution of plane and spherical triangles. One difficulty in obtaining the preliminary data, that will be readily appreciated, is in measuring the exact length of the shadows, as an error of one-thousandth of an inch will make a difference of a whole day in the result. The shadows having been measured and the latitude being known, it is not difficult to compute the sun's declination, and the hour angle, from which the data may be obtained by a reference to the "Nautical Almanac," but as there are two days in the year which will answer these conditions—one when the sun is moving toward the summer solstice and the other when it is traveling in the opposite direction—it will be necessary to consult the weather conditions of the picture so far as possible to ascertain the season.

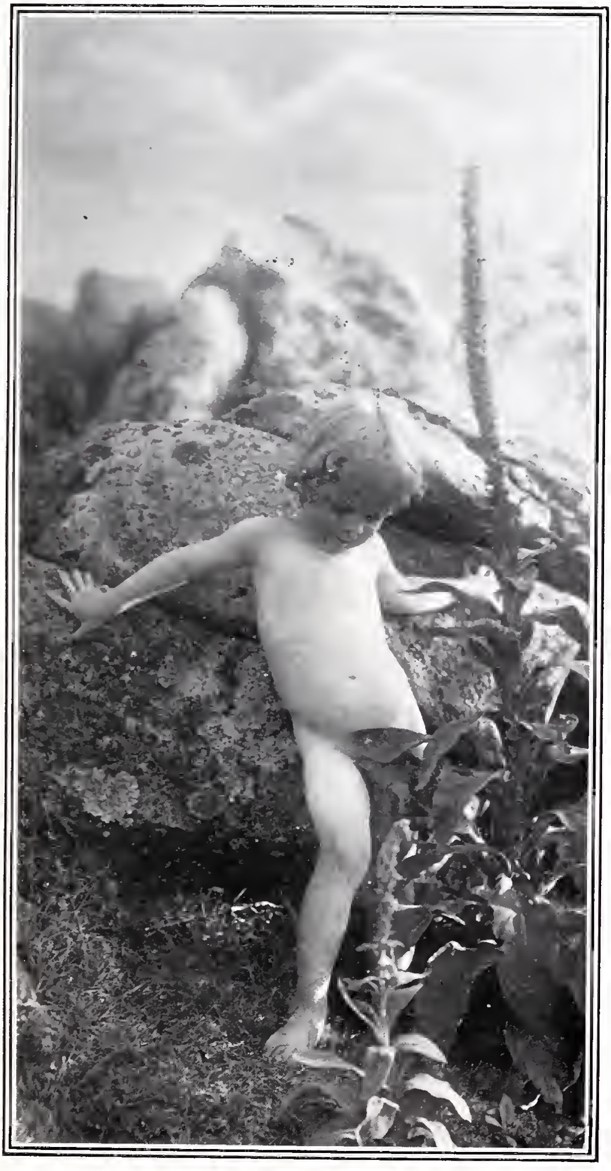
This may be closely indicated by the direction of the wind, as shown by the weather vane, considered with the condition of the atmosphere; if the latter is transparent, distant objects will appear distinct; and if thick and muggy, the landscape will be more or less blurred. The records of the nearest signal station will show the various kinds of weather for the different months of the year. In such manner the data may be determined.

Now as to the position of the camera. Prof. Rigge says there are in general two methods of solving the problem—the physical and mathematical; the one embodying a careful scrutiny of the view and the selection of the spot from which the view is identical with that presented by the photograph. This, of course, involves a personal inspection of the building; but the investigator in Maine may not find it convenient to travel to Kansas to find out where the camera was set up. He must then resort to the principles of perspective, and he must also have a plan, etc., of the building.

It is unnecessary to say here how the problem is completely solved step by step; suffice it that from the inspection of a photograph of the Creighton Observatory, Prof. Rigge found that the picture in question was taken on Tuesday, May 2d, 1893, at 3.06 P. M., and that the position of the camera was 72′ 7″ south of the centre of the dome, that also the focal length of the lens for this photograph was 13.47″.

The solution of this problem indicates clearly how much information can be obtained from the plane surface of a photograph, and those who are interested may find Prof. Rigge's story of his achievement in detail in a recent number of the *Scientific American*, from which this brief account has been compiled.

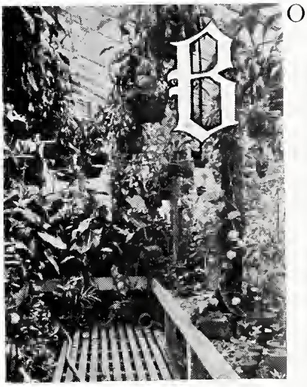
Bright Eyes. G. K. Muntz.



NATURE'S CHILD. R. H. KIMBALL.

# The Botanic Garden, University of Pennsylvania.

**By W. H. Walmsley.**



Nepenthes House.

BOTANIC GARDENS, in which are gathered individual members and families of the vegetable kingdom from all portions of the globe for purposes of study, are to be found in most of the capitals and centres of learning throughout Europe ; also in Calcutta and other cities of Asia, in Australia, South America and elsewhere, of more or less completeness and extent. In all of these, the plants are grown nearly as possible under conditions approaching those of their natural habitats, thereby affording means of studying their habits and structure that otherwise would not be obtainable by the vast majority of botanists and students. In our own country but little has yet been done in this direction, although a notable beginning was made in its early history by the celebrated botanist, John Bartram, who in the eighteenth century planted his world-famous Arboretum on the banks of the Schuylkill River, near Philadelphia. An extensive traveler and collector, in correspondence with the leading European botanists of that day, he was enabled to gather into this garden a really wonderful amount and variety of hitherto undescribed American and foreign plants and trees, many of which are living and flourishing at the present time. The great city near which the Arbortum was founded, having long since encompassed it, has now added the beautiful garden to its system of small parks under the name of Bartram's Garden. Through the loving and intelligent care of the Botanical Society of Pennsylvania, it will doubtless continue to grow and blossom as in the long ago, and become a Mecca for botanists from all parts of the globe. This was probably the earliest botanic garden in the United States.

Sago Palm.

The garden of Pennsylvania's great University, which it is our purpose now to consider and illustrate briefly as the subject will permit, owes its inception and very largely its growth to its present exalted position, to a single individual, the eminent botanist and scientist, Dr. John M. MacFarlane, who some dozen years ago left his native Scotland full of honors to take up his life-work as Director of the Biological Department of the University. He found an inadequate building —soon to be replaced by one up to date —standing on the borders of an old dumping ground some five acres in extent at the southern end of the University's holdings, and not much more. Very unpromising, but he was equal to the task he had set for himself — the making of a great school in vegetable biology and physiology—with full appliances and surroundings for its successful prosecution. In this endeavor

Rustic Arbor.

he was fortunate enough to meet with sympathetic and powerful aid. The University, as a corporation, was not particularly interested in botanical research, but its distinguished Provost, Mr. C. C. Harrison, was from the first in full sympathy with Dr. Mac Farlane's projects, and by his sound advice, liberal financial helps and the securing of donations from others, made possible, in a monetary direction, the transformation of that desolate dump into its present loveliness and beauty. Notable among these benefactors is Mrs. James McManes, through whose generosity the venerable sago palm, noted elsewhere, found a resting place in the palm house. Many very valuable contributions of plants have also been made from time to time, notably of orchids several hundreds in number, from Messrs. Le Boutillier and Dissell, and a gift from Mr. R. C. Banes of a wonderful collection of filmy ferns, obtained in Jamaica, for the necessary care of which a special glass house had to be built. The organization of the Botanical Society of Pennsylvania, some seven years ago, has brought a continued accession to the number of those interested in the garden and its growth. Although distinctly an institution of the University, its steady increase in membership

Class Gate and Dormitories.

Hamilton Walk.

has been recruited from all classes of men and women interested in botany, most of whom are enthusiastic in their love for the garden and anxious to do all in their power toward its increase in attractiveness and usefulness. Indeed, a very large share of the wonderful progress made in the last half dozen years is attributable to the efforts of these individually and as a society,

Lily Pond.

Among the glass houses grouped about the central building in direct communication with it and each other, may be mentioned the Palm house, Nepenthes and Sarracenia houses (containing the richest collection of those plants in the world), the Orchid and Filmy Fern houses, etc. In the Palm house stands a remarkably fine specimen of the Sago Palm, venerable, but with as fine a leafy crown of green as it wore in more youthful days. To its sturdy trunk a brass plate is attached bearing the following legend:

"I was born about one hundred and fifty years ago in the Land of the Rising Sun. There they named me Sagobei Shuro, but here I am known as Sago Palm, and botanists call me Cycas Revoluta.

"I lived in peace among my fellows till about five years ago, when some of the skilled gardeners of my native land severed my roots, removed my leafy crown and packed me up like a mummy. Then they sent me across the wide waters to this great land of the

Lily Pond and Stone Steps.

Setting Sun. There I lived till a botanist from the shrines of learning in this City of Brotherly Love revered my age, genealogy and stature, and so desired to have me.

Lily Pond and Rock Garden.

"By the generosity of Mrs. James McManes I was secured for my present abode, where, by kind treatment, I have regained my old dignity and leafy crown.

Though far from my native home, I can survey the wonders of this great institution and exclaim, 'I am the oldest living being in the University; nay, more, when those who now serve it are gathered to their sires, I hope to be green and flourishing.'

"Sagobei Shuro, 1903."

It should be noted that this is a *teaching* and *research* garden in direct communication with a building specially constructed for the same purposes (with surrounding hot houses) in which students have worked directly on physiological problems for the past nine years. Dr. Mac Farlane has always maintained that most of this class of work can *only be done* in houses where the plants grow naturally. It is unique in being so related to the building and to a great University, almost in the centre of one of the world's greatest cities; and, from its facilities, numerous valuable contributions have been made to botanical science. In the garden as well as greenhouses the grouping of plants of same family and order

Lily Frog Pond.

has been carefully followed, and their natural surroundings and methods of growth followed closely as possible. Water plants find themselves at home in the ponds or close beside them. Those that love to grow amidst stones and rocks have the same familiar forms about their new homes in the rock gardens; others, again, requiring to be kept in the shade, are planted under rustic vine-covered arbors, beautiful features of the garden in themselves.

THE BIRDS' BATH.

Although, as already stated, the botanic garden is primarily intended for study and research purposes, the problem of beauty has been ever kept in view, so that its landscape effects are equaled by few other similar institutions, and probably excelled by none. At least this is the opinion of a competent friend, at present visiting the principal gardens of Europe, who writes: "The effect of Hamilton Walk, when somewhat more grown and matured, will not be equalled, I judge, by any such walk in the world." And he is not an American, who might be prejudiced in favor of his native country, but a foreigner by birth and education. Hamilton Walk, be it noted, extending quite across the garden at its northern end, is lined throughout by academic poplars, and ever-green rhododendrons, behind which rises the lengthened and picturesque facade of the dormitories. It becomes the main approach to the garden from Woodland Avenue, and a fitting introduction to its many beauties and attractions, which are entered upon at once after passing

LEDGE BORDERED LILY POND.

through the gateway at that point—the most picturesque among the several that afford ingress to the grounds. Here Woodland Avenue and Hamilton Walk come together at an acute angle, the dormitories extending along each, affording, with the highly ornamental gate, a most beautiful and attractive threshold to the loveliness beyond. A fairyland of winding, shaded pathways, of lily ponds exhaling sweet scents, of rock gardens filled with bloom, of other ponds overhung by weeping willows, and the corner of a greenhouse—it may be just visible across their waters—teeming with golden-hued fish; of others again, approached by rustic stone stairs, and from which the occasional bellow of a giant bullfrog may be heard. Here is a tiny rivulet dashing merrily adown the stones of a steep declivity, in a shady nook peopled by an innumerable company of birds bathing and making merry in a joyous way. Tired mothers, nursemaids, with their charges, romping, chattering children, working-men from the hot streets seeking a few moments of rest beneath the trees at noonday, students lolling upon the green slopes, making pretense of study; in short, types of the varied kind that go to make up the habitants of a great city, may be found here upon any pleasant day

Lotus Pond.

throughout most of the year. For the garden is free to all, and it is pleasant to record that no injury to its precious contents has ever been known to occur from abuses of this freedom. Indeed, all seem to have the grounds under their protection whilst enjoying them. Not the least commendable features of the garden are the facts that it is a lung for the crowded city, which, possessing the unequaled Fairmount Park, has far fewer central open spaces than most other towns or cities, and that its sylvan loveliness is so freely offered to the people, hundreds of whom come daily to enjoy the scenery, the shade, and the beauties of nature and art here gathered.

CLASS GATEWAY.

Another entrance (but not directly into the garden) is to be found at Thirty-sixth Street, adjoining the Pepper Clinical Laboratory (an adjunct of the University Hospital), which is marked by a simple but very beautiful class gateway opening upon a branch of Hamilton Walk, into which it leads and will shortly correspond in shrubbery, trees, and general effects. Through this gate the medical students go most conveniently to and fro between the old college on

NEW MEDICAL LABORATORIES.

Thirty-sixth Street and the new medical laboratories so recently erected on the south side of Hamilton Walk, by the imposing front of which, all must pass to reach the garden by this route.

Memorial Tower Gateway.

By far the most striking approach to the garden, however, is through an archway under the noble tower at Thirty-seventh Street, and across the great quad of the dormitories to Hamilton Walk, about midway of its length. This tower was erected as a memorial to the graduates and students who fell in the late Spanish war, and is an integral part of the dormitories. The street front is so greatly obstructed by telegraph poles and wires that it was found impossible to photograph it in a satisfactory manner, but that facing the quadrangle (being identical in architecture) has been substituted for it. A view within the quad shows the relation of this fine architectural subject to the general effect of the dormitory buildings.

Crossing the quadrangle to its southern and still open side—shortly to be closed by an extension of the dormitories and the erection of a commons and chapel—one has an extremely fine view of the new medical laboratories facing the eastern extension of Hamilton Walk, which will be forever unobtainable upon completion of the buildings just named. The quadrangle itself offers many architectural subjects for study and pleasurable inspection, noteworthy among which are numerous unique gargoyles sculptured upon the dormitories.

Quadrangle and Memorial Tower.

New Medical Laboratories.

Passing through the open gate, as seen in the centre of the picture, a few steps will take one into Hamilton Walk, where, turning to the right, its westward stretch to the Woodland Avenue entrance greets the eye with fresh beauties of sunshine and shadow, of green and bloom, with the dormitory windows peeping through the foliage. Happy, indeed, should the fortunate young occupants of these domiciles be, with the books of nature and of art, of science, of learning, of all that goes to upbuild the soul and the brain, and to make men of them, lying open to their touch.

It is earnestly hoped that all readers of this imperfect sketch who may be interested in the subject of which it treats, will not fail--should they chance to be in Philadelphia at any time—to visit the Botanic Garden, and see for themselves the realities so feebly pictured here in half-tones and in words.

Glimpse of Dormitories.

Hamilton Walk and Dormitories.

THE BARN YARD. OTTO FULLGRAFF.

# The Photographic Outlook.

*By W. I. Scandlin.*

ONE of the most interesting and promising signs of the times, from the viewpoint of the professional photographer, is only just beginning to make itself apparent. This sign of promise is to be read in all parts of the country in the increased attention that is being given to the development of what may be termed the purely business end of the photographic problem.

State associations everwhere and the national body as well are taking the matter under advisement and are devoting space in their programmes and time in convention to its exploitation and discussion. The several photographic journals throughout the country have almost without exception devoted considerable space to this subject during the past two or three years and it is more and more claiming and holding the individual attention of the progressive professional.

It is now coming to be very generally conceded, that, as Mr. C. J. Van Deventer, First Vice-President of the Photographers' Association of America said in a recent address before the Wisconsin Association in convention at Milwaukee, "Most of us are 'long' on the artistic and 'short' on the business side of photography."

Technique is of course most important in any craft, but if all effort is devoted to perfection in the mechanical manipulations requisite to the production of any article of commerce, its sale or the demand for it will naturally suffer.

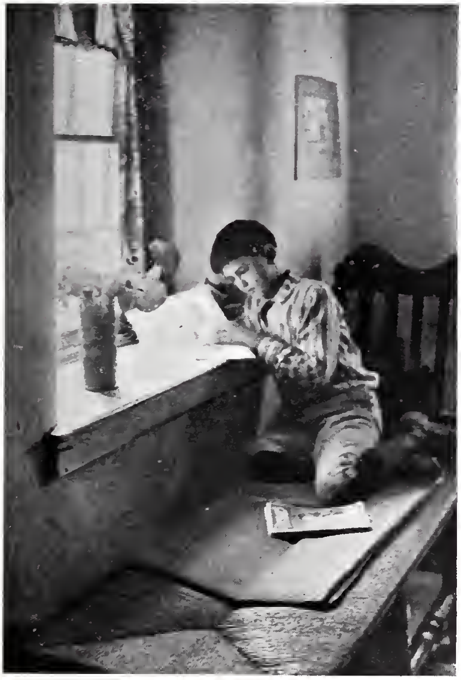
When, therefore, workmen in any branch of business turn their attention to creating or fostering a demand for their products, they begin to grow and to widen their field of usefulness and profit materially. Every effort that is made to widen the territory over which their goods circulate brings new and valuable information concerning the condition in that field. A better knowledge follows of what the trade demands and of how to meet the requirements of the occasion.

The professional photographer has for many years not troubled himself much if any with questions of business of any kind excepting such as were intimately concerned with the inside work of his studio. He has attended diligently to the turning out of such work as Providence sent his way and then, in many cases at least, has contented himself with waiting for more. Meantime, however, new forces have been quietly at work and the conditions that have not already changed are rapidly doing so all over the land. These changes began to make themselves visible some years ago when the old established gallery which for years had done all or nearly all the photographic work of some properous community waked up to the fact that its business was falling off and going to the establishment of some new man. He, while turning out work of perhaps inferior quality from an artistic or technical standpoint, nevertheless knew how to keep himself prominently, favorably and frequently before the public. The past few years have seen many good workmen pushed out of the field by less competent photographers who were, however, endowed with the business faculty that enabled them to create business for themselves, where none had been before.

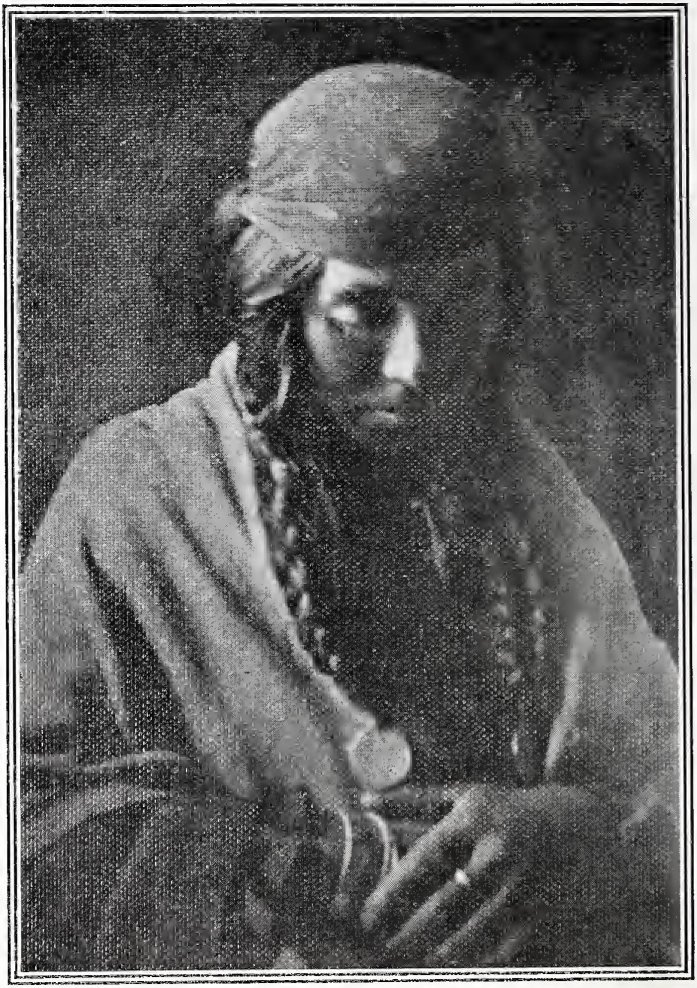
As the situation is becoming clear and photographers are realizing as they never have done before that they must adopt modern methods of business in their studio and conduct their work on the same lines that alone make other business profitable, the outlook of the professional photographer improves.

In waking up and reaching out after more business he unconsciously expands in every direction. The adoption of a more progressive policy in one part of his establishment, leads to improvements in other lines, until almost before he knows it, he is producing work of a better technical, more artistic and more salable quality.

The discussion and adoption of modern business methods in the photographic studio is one of the most promising signs for the future of the photographic craft. It is only yet in its infancy, but it has come to stay.



A CORNER. George Donehower.



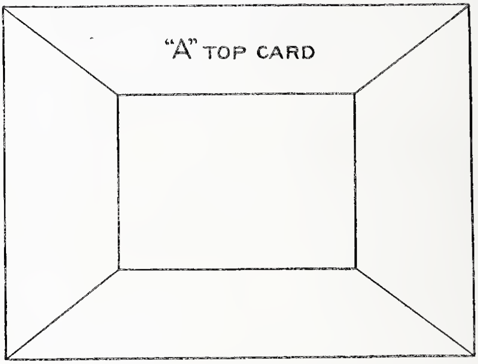
GYPSY MOURNER. Louis Fleckenstein.

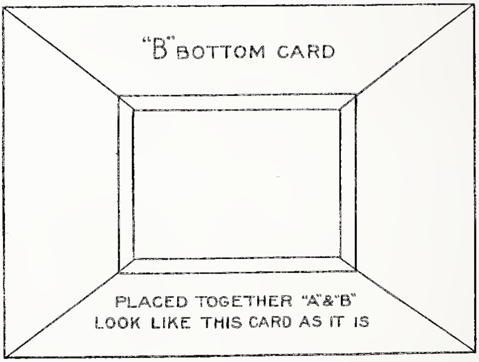
# Simple Apparatus for Cleaning and Backing Plates.

*By David Gray Archibald.*

IT is not only desirable but highly necessary that you should thoroughly clean the back of your negatives before you print from them. A simple way to do this is to take a piece of card board, thinner than the thickness of the negative glass, and cut an opening in it the size of your plate (see "A"). Next take another piece of card board and make an opening in it slightly smaller than the first, say an eighth of an inch less each way (see "B"). Place this second and smaller opening card beneath the other and bind them together so that they will resemble "C." This will give you a useful piece of apparatus with which to not only clean your negatives but to coat their backs with when using non-halation compounds. It's so easy to do, its use will encourage better work.

To use it, you place the negative face down in the opening; when so placed it will be held securely in place in the card and yet only its extreme edges will be in contact with anything, and they rest on the narrow band formed around the inside of the opening by the card underneath. The rest of the plate will be free of any contact and therefore in no wise liable to be scratched.


"A" TOP CARD


"B" BOTTOM CARD
PLACED TOGETHER "A" & "B"
LOOK LIKE THIS CARD AS IT IS

# Photographs in Water Colors.

*By Henry C. Delery.*

THE desire and intent to reproduce photographs in natural colors is contemporaneous with the discovery of photography itself, for no doubt Daguerre and his co-workers strove to obtain the fugitive colors of nature in permanent form, just as they were transmitted through the lens to the translucent screen of the camera. From their efforts was born the Daugerretype, which was at that time regarded more in the light of a curiosity than a work of art, and accepted as the forerunner of a perfect color process. In an attempt to remedy the death-like appearance and hue of the picture, artificial coloring was resorted to, examples of which may be seen at the present day.

And well may we agree with the pioneers of the photographic world, for of all the shortcomings of photography this is the greatest, as is witnessed by the unending quest of photography in colors and the instant popularity of any process which promises to complement the fidelity of the photograph with the delight of color; for who, in looking at the reproduction of some familiar scene, has not wished for at least a suggestion of color in the print to complete the illusion of nature?

But whilst acknowledging our deficiency, we may well follow the example of the great prophet Mohamet, who, when conjuring the mountain to come to him, and seeing his request unheeded, wisely exclaimed: "If the mountain will not come to Mohamet, Mohamet will go to the mountain." Hence, in our inability to woo the beautiful colors of nature on our picture in the camera, we may at least apply them with the brush.

There is one point of vital importance to be first considered, the adaptability of the picture for this character of work, both artistically and technically. It is an undeniable fact that some prints have the happy faculty to appear perfect in simple monochrome, as, for instance, certain marine views in dark sea green tint, also architectural studies conceived in sepia; for these the addition of color would injure rather than enhance the beauty of the picture ; but, alas, these instances are the exception rather than the rule. Again, from a technical standpoint, all pictures do not lend themselves to the color treatment, and here may be the cause and secret of many failures. We will quote for example a view, say of a river hemmed in on either side with trees and shrubbery and crowned with a cloudless sky above. It must be readily conceived that the inharmonious monotony of the predominating blue and green, offer no relief, and tends to give a lifeless picture.

But to refer to a more precise application of the subject. There are very few photographic papers which afford the possibility of artistic color treatment—in fact, to my mind, there is only one which can be safely employed—the pure platinum, which, in the hands of an adept in the use and application of colors, can be used to closely resemble the genuine water-color, so as to require the eye of an expert to discover the subterfuge. Other papers have been and are employed, but they remind one more of the glarish effect of a chromo than the artistic fineness of the platinum print.

The negative which yields the best print for treatment is one in which the high lights and shadows are well balanced; the former strong, yet not too dense, only enough to produce clearness without chalkiness and with transparent shadows, rich in detail. The print must be soft and be of light tone, several shades lighter than the usual print, one in which all the gradation of tone of the original are indicated but not printed to their full depth

A WINTER BROOK
G. Edwin Keller

And now a word concerning the colors and brushes. These need not be very expensive or numerous, only a few are required. As to the colors, we strongly recommend the Winsor and Newton dry water colors, being absolutely reliable and far superior to the various liquid dyes or tints offered to the public. The dry colors are very economical, and can be purchased in cakes, a one-half cake lasting an indefinite time. The assortment need not be very large, as the student will find that with a few primary colors an infinite variety of tints can be produced.

We suggest the following as an initial outfit : Rose madder, vermillion, carmine, vandyke brown, sepia, burnt sienna, cobalt blue, Prussian blue, Naples yellow, gamborge, yellow ochre, neutral tint, and Chinese white.

Small porcelain saucers to prepare the colors must also be provided. Brushes may be either sable or camel's hair, and of different sizes. Small brushes should be avoided except for extremely delicate work, a medium size, say a No. 6, is more serviceable. It is a mistake to imagine that a very small brush is required for fine work, for a good brush will always come to a fine point when wet, and when buying same care should be observed that it fulfills this requirement. A large brush is desirable for broad washes and moistening the prints preparatory to tinting.

The best position to place oneself when applying the colors is next to a window facing a north light, where a soft and steady illumination can be had ; the operator should sit sidewise to the window with the left side nearest the source of light. Here the picture will always be free from obtrusive shadows cast by the hand, etc. The picture is attached with thumb tacks to a small board, and this is placed with its upper edge slightly raised so it will have an inclined position ; this facilitates the flow or the color when applying large washes and thereby prevents a dauby, streaky appearance in the picture.

When all is in readiness we may proceed to prepare the colors. A drop or two of water is placed in the saucers and the cake of color is lightly rubbed upon same until the required amount is produced, but do not use too much water, only sufficiently to moisten the end of the cake, otherwise the water will be absorbed along its sides and when drying causes numberless cracks, which crumble and cause no small amount of annoyance ; the prepared color is thinned to the proper consistency. Several sheets of white blotting paper must be at hand and a glass of clear water for preparing the tints and washing the brushes.

The first stage in coloring is to moisten the whole print to facilitate the flow of the washes and that they may not be absorbed too quickly into the pores of the paper ; the large brush is used for this purpose, and by rapid strokes, beginning at the top and moving downwards, the whole surface of the print is gone over. It is then set aside until all surplus water has disappeared and the surface is moist.

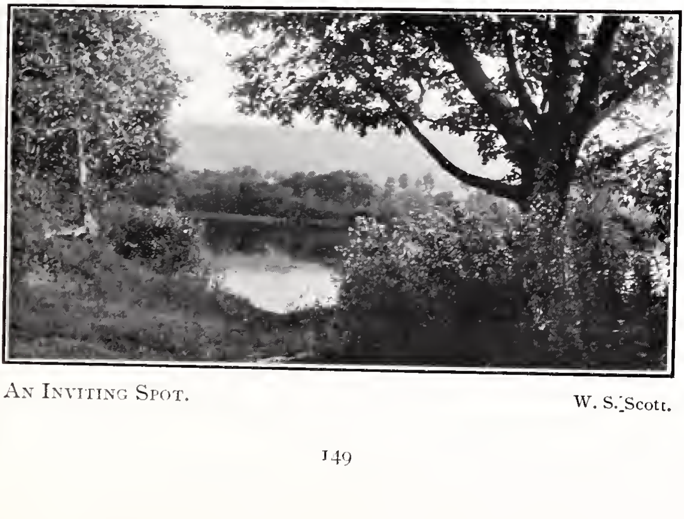
The first colors to be applied are the broad washes, such as the sky and meadows in a landscape. For the sky use cobalt blue; the color must not be too thick; it is best to err on the side of thinness and put several applications rather than give one coat which would ruin the picture at the onset. If the sky be pure white in the print and only a blue effect desired, the brush (a No. 6) is filled with the color and spread on the surface of the paper, beginning at the top with horizontal strokes and gradually diminishing the strength of the tint when the landscape portion is reached. If there are trees with the sky intervening between the branches, they must be gone over unhesitatingly, as these will be touched-up later with darker tints.

If a sunset effect is desired, the horizon is lightly tinted with a little rose madder and yellow and gradually blended into the blue. The coloring of clouds is a more delicate operation and requires a little skill. For this purpose the novice had better procure a model of acknowledged merit and study the effects produced thereon.

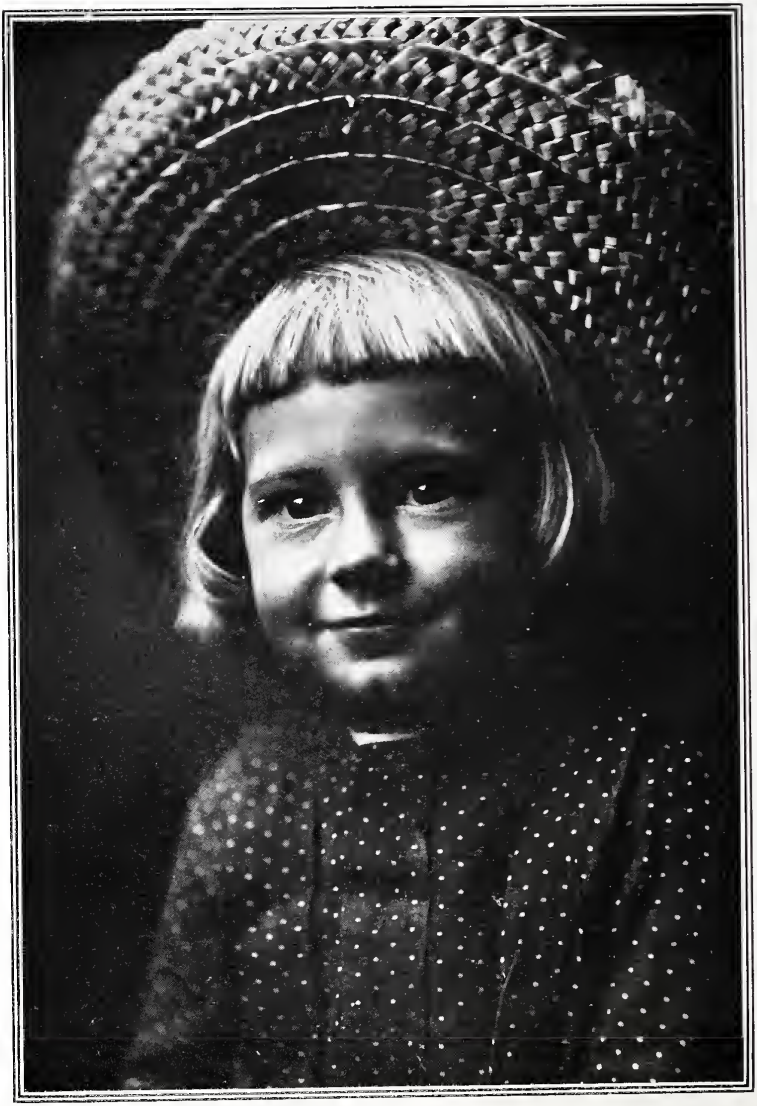
If the subject be a landscape, our next attention must be directed to the trees and foreground. Those portions of the view which are sunlit should be given a light wash of Naples yellow, in different degrees of strength ; be careful to have the foreground strong and bold and the distance subdued, gradually blending it to a greyish purple to gain atmospheric effect. One of the most important characteristics of color in nature is the endless gradations which always accompanies it, and this we should strive for. It does not always follow that because a tree is green all should be painted in the same shade. Let us examine nature closely and we see that the different intensities of light, according as to how it strikes the object, causes different shades and hues, and the advice of Ruskin to a beginner is that, "It does not matter how small the touch of color may be, though not larger than a pin's head, if one part of it is not darker than the rest, it is a bad touch."

Trunks of trees can be gone over with Vandyke brown, sepia, with sienna and green for a variety, and the highlights with pure grey. Hooker's green No. 2 will do for meadows and foliage of trees, lightened with gamborge for the brighter parts and darkened with Prussian blue. The shadows can be put in with a little Vandyke brown, and the highlights may be touched with some brighter colors.

For a sunset at sea the water is given a wash of dark green, except in the path of the sun's light, which is tinted with gamborge. The sky in the immediate vicinity of the sun should also be painted gamborge and gradually diminish into the clouds, which can be given a purple hue alternating with blue. Of course these are merely suggestions, as it is impossible to give any set rules, each picture requiring an individual treatment, which can only be attained by diligent study of Nature and observing her in all her different moods.



AN INVITING SPOT. W. S. Scott.



FAY. MRS. W. W. PEARCE.

# Art in Photography.

*By W. E. Bertling.*

WHAT constitutes art in photography? In attempting to answer this question one is not only required to have great moral courage but the ability to take "punishment" and "hit back in clinches" as well. There are hosts of authorities who have denied that photography is art, who have proclaimed from the house tops that photography is a mere mechanical institution microscopically recording brute facts only, leaving nothing to the imagination, embodying nothing of the *spirituelle*. However, I do not wish to argue the mechanical merits of photography; be that as it may, the finished result will vindicate the method of its production. Still, it may be well to remind our artist friends that pigments were no doubt compounded in a laboratory and carry some of the factory atmosphere with them until superimposed upon canvas or paper. So far as their art goes, it is simply a clever arrangement ot mechanical, or rather mineral, elements to produce a harmonious result. Is photography less?

So far as the art side of the argument is concerned, everyone has a personal pet theory—it is much like that humbug "composition" argument. When you have produced a well-balanced picture that pleases the eye you have paid heed to "composition;" where you have photographed an unwieldy piece of landscape that would not conform to your ideas, you have not "composed" properly. The roadway refused absolutely to contract itself into the serpentine S line; yonder stoic tree would not so far accommodate you as to move one inch into the foreground, and in despair you pressed the bulb any way—"any old way," in fact—thinking you could strike that stubborn piece of composition a blow in the *solar plexus* by dexterous manipulation of shears. But it was no use ; it fell to the ropes, took the count, and came up smiling ; shears had apparently been constructed to abbreviate hair instead of produce art.

The point I particularly wish to illustrate is this: That in nine cases out of ten the person who advances an art or composition argument, finds some picture he likes and then starts building theories around it—very much like buying a ten-acre lot and building a fence around it. It reminds me of the Dutchman's method of making a cannon—just take a long hole and cast a coat of steel around it.

Take some old picture and build a theory around it, then when you get to the centre of it you find no substance there.

Art is, after all, very much a matter of opportunity. If you find elements that group to compose pleasingly, why it is an easy matter to secure the perfect picture. Yes, I admit one must have a trained eye, but you get that after contributing several cases of plates to the ash barrel. It is true that we are all more or less short-sighted; we don't see half enough, nor do we see possibilities that may yield artistic results under other conditions. To illustrate, did you ever walk afield or along the highway for six or seven miles without the slightest view of an "art possibility" to practice your ammunition upon ? You know what it means then ; you become disgusted with the situation, and should any one mention going over that strip of territory again, the chances are that you would feel inclined to so decorate his dial that it would closely resemble a fuzzy-type.

Now, here is where you make your greatest mistake, NOT in giving way to your artistic temper, but in relegating once explored territory to a region not upon your visiting list. Here's the point: Always take note of possibilities ; if your elements compose properly, yet require a cloudy or misty day for surrounding them with proper effect, don't be discouraged because the sun is bright and the sky clear. Always make mental notes of what you have seen, and remember that conditions are hardly ever twice alike ;

a failure one day may mean success the next, and many visits to the same territory do not exhaust all its possibilities.

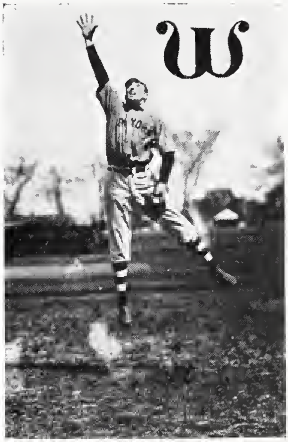
Now, in relation to the real art picture—or I should say photographic art creation—it is just as possible to produce a photographic art result as any other kind of an art result. I have heard a member say that the great tendency is to produce sad things. We go out into the good, cheerful sunlight and make mournful evening effects, sniffle a little over them, and then call in the long-haired bunch with the flowing ties to tell us how nice they are. We have a marked disposition to turn out pictures that would in nine cases out of ten argue the author had an evil conscience or had reason to fear some woman's husband. Now, we all know the camera is a pretty bad liar when controlled by unscrupulous hands, but for goodness sake don't degenerate the poor instrument to the greater crime of pictorial murder.

Many of our up-to-date photographers seem to think that real art amounts to a pictorial guessing contest ; they seem to think that a picture must be about as rough as the surface of a ploughed field to be artistic. I am not arguing against broad treatment, understand, but the point is this : Your picture must have a pair of broad shoulders to carry a heavy burden ; it must have carrying qualities before you can introduce the furrows ; it must be of such force and simplicity that you may stand at least six feet from it and determine the whole image at a glance ; it must be large enough to be seen at a distance, then the roughness or broadness may help it.

It lies not within the knowledge of my poor brain to determine where art leaves off and insanity begins ; but I would, however, implore all photographers to be moderate, be temperate, practice sobriety, and you may at least find the keyhole to success.

# Sporting Photography.

*By Robert W. Tebbs.*



WHEN the proposition was made to me to contribute a short article to The Annual, I accepted without fully realizing what an undertaking I had assumed. Newspaper photographers have not much time for magazine writing. You just get settled with a pen in your hand when a ring comes from the City Department for "inside and outside work," or some other assignment, and the budding writer will put his pen and ink away, and maybe not get another chance to take it up again for many days. I was not told just what department of the photographic art—for, notwithstanding the art critics, I still insist that it is an art—I was wanted to cover, so shall take up the subject of "Sporting Photography" in connection with the daily newspaper.

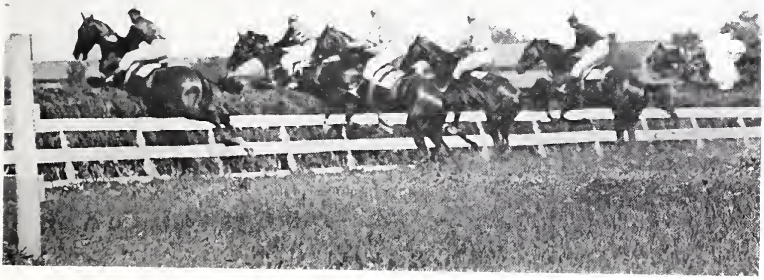
The majority of photographers agree that the best camera for this kind of work is a reflecting camera of some sort, preferably the "Graflex" or "Reflex." At the first start off the "man behind" is liable to run up against all kinds of difficulties. One of the first will be *too much speed.* On the brightest kind of a day the writer has used so much speed on a wide open lens that only the faintest outline could be developed. Another great fault, and the hardest to overcome, is the habit of "shooting too soon." The eye seems to travel too fast, in my opinion. Only recently I was taking the picture of a horse race, and distinctly saw the leading horse run off the end of the plate, but when I came to develop I found that, while I had all of the horses

APPROACHING STORM

R. E. Weeks

on the plate, they were not at all where I had expected to find them.

In newspaper work the main cry from the "powers that be" is for something new. "Go to the baseball game and get something new," is to be heard almost every day, and you'll scratch your head and wonder what on earth there is about baseball that has not as yet been photographed. And yet if you sit out a game you will see a thousand and one little incidents that will make just the kind of a picture that is being asked for. For instance, take the different umpires in the two big leagues, and get a picture of them in their characteristic attitudes of yelling, "You're Out." All of them do it in a different way, and many of them do it so that if caught with a camera it would make a laughable picture.



The accompanying picture of horses jumping, also illustrates this idea. The five horses going over the jump, taken from the rear, is enough out of the ordinary to get from the editor, "That's what I want," and the single horse just rising for the jump is of the same character. The horse in question did clear the jump, although it looks impossible for it to have done so The other picture of the lady on horseback, although a striking picture, is more liable to find its way to the waste paper basket than the former on account of its lack of originality.

No two sports lend themselves to photography in the same way. Take, for instance, baseball and football. Baseball plays are so quickly executed that the exposure has to be made practically "in the dark." Take, for supposition, a slide. You cannot wait until you can see what is going to happen, but must shoot as soon as the slide is commenced, otherwise the man will be up and gone before you are ready for him. Football, on the contrary, is a case of having to wait. If I had made my exposure when the ball was put into play in the accompanying picture, I should have in all probability got a lot of backs. By waiting I succeeded in getting almost all of the faces of the players of the two teams and a great deal of action at the same time.

It behooves a photographer who is going to follow the sporting game to *make himself familiar with the game he is up against*, and get to know as many of the players as possible. Many times I have seen a man make a lot of exposures and not have the slightest idea what *caption* to put on the photograph when it was finished.

Did you ever hear of a newspaper photographer having pride? A good many start out with it but, alas, it is an awful load to carry around. At some of the race tracks this year the newspaper photographers have been "strictly up against it." I had an appointment with a gentleman at one of the tracks the other day to get his picture, and was standing waiting for him at the place he had designated, which happened to be near the betting ring, when a photographer from another paper came along and proceeded to take a picture which necessitated his pointing his camera toward the ring. There was no sign up to the contrary, but no sooner had he done so than a man in civilian clothes, without any badge of any kind showing, rushed up and tore the race track badge off the man's coat, and then proceeded to come toward me to repeat the operation. He put a grimy-looking hand on my clean waistcoat, but I had seen him coming and had my badge out of the way first. We

hunted up Mr. Pinkerton and made a complaint, but, with the exception of the man having his badge restored, there was "nothing doing." Complaint to the stewards was out of the question, and we had to submit to be followed for the rest of the afternoon by a detective, who was given instructions to follow us wherever we went.

Should you take the picture of a man who does not want to be photographed, it will often bring down upon your head a string of profanity, and your only redress is to get out of the way as soon as possible. More than once they will try and break your camera, so it doesn't pay to stop and argue.

It is the aim of the majority of the sporting photographers to get the object to be photographed as sharp as possible on the plate, and both Mr. Hemment and I had that object in view when we went to Ormond last winter to cover the Ormond–Daytona auto races for *The American.* A fine light enabled us to use all the speed that we thought necessary, and we took several dozen photographs, and as the assignment was a "rush" one (what newspaper assignment is not?) we did not stop to develop the plates but sent them on the first train to New York. After a couple of days I decided, just for my own satisfaction, to develop one of the plates to see how the exposure was. I obtained a perfectly satisfactory negative, and what was my astonishment next morning to receive the following telegram:

New York, Jan. 24, 1905.

Hemment & Tebbs, Hotel Ormond, Fla,

Photographs sent are particularly worthless. I cannot see how two presumably competent photographers can send us such stuff?

This, mind you, was from one of the biggest of the big at the office, and Hemment and I at once got the telegraph wires busy to find out what in the mischief had happened.

It turned out that the fact of the races being run on the damp sand there was no dust, and consequently there was nothing to show that the machines had not been posed. So thereafter we widened our slots and got a little movement on the negatives, which goes to prove that you can make no set rule about getting things sharp if you always want to give satisfaction to the "man higher up."

Now for a word of advice, if I may be allowed to give it without presumption, to fellow photographers that are thinking of taking up "sporting photography:" Make your outfits as light as possible. One lens, a 10, 11, or 12-inch Goerz or Cooke will cover all kinds of work. If you are going on a long trip film packs are undoubtedly the best things to carry, especially as the Eastman Co. now has them, so that you can draw out as many films as you want to. You may be gone out of reach of a dark-room for the entire day and to carry around three or four dozen plates will in all probability tire you out before noon.

Another suggestion is to *get away from the bunch*. I may be wrong in this, but personally I find it a good thing to try and get stuff that the other papers will not have the next morning. The majority of the New York newspaper photographers get all in one spot and are in that way often enabled to help each other. This, while all that could be desired from a non-throat-cutting point, is not, in my idea, the way to get the best stuff. Take a big race. The next morning all the newspapers that publish pictures will in consequence have the identical same picture. Get away from the bunch, and

A Cup Defender. Robert W. Tebbs.

try and get a little originality into your work and you will not find any complaint coming in from the editor because you have got the same picture that the other fellow has.

Don't come back to the office and tell the editor that you couldn't get anything. Get something, no matter what it is, for no excuse is worse than "I couldn't get at it."

A boy came down from New London the other day, and because he had done well in that town he thought he could do the same in New York. He got a job, and about the third day he was sent down to the race track. It was windy, but otherwise the conditions were all right for good fast work. He returned to the office and told his employer that the dust was so great he didn't think he could get a picture and so didn't try. In all probability if he had made an earnest effort he would have got an exceptionally fine picture showing the horses coming out of a cloud of dust. But he didn't try, and now he is back again in New London.

My last "don't" is practically a "do." *Do your own developing.* Nothing is easier than to get into the habit of sending your work in and then going home. Do your own work, and then if anything goes wrong you won't be able to say, "Well, he must have used old developer" or some other time-honored excuse, and you will be able to rectify any mistakes you may have made the next time you are sent out.

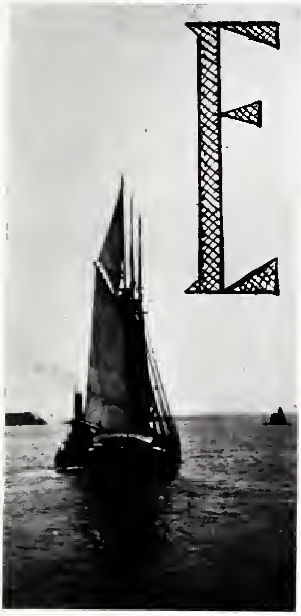
*Caption* your negatives *to-day*, for nothing is easier than to forget names to-morrow that you might remember to-day, and a captionless negative is practically worthless, no matter what the subject or how well it may have been taken.

I could continue writing "do's" and "dont's" till I was blue in the face, but I fear that I have already overstepped my space. In closing, let me say just this: When you have made up your mind that you are a mighty good photographer, are quite determined that no one can give you any points on how to take and how to finish photographs, then you may be perfectly sure that you have at last reached the foot of the ladder and that it is time for you to get to work and learn something, so that you may start in and climb, and some day you may be so fortunate as to reach one of the top rungs, and even then you won't know it all by a long shot.

A WINTER LANDSCAPE. THOMAS A. MORGAN.

# What Is Art?

**By A. H. Griffith.**



EVERY week, almost every day, I am asked, "What is Art, or how can I make a thing artistic?" Art is that intangible something which is just beyond the grasp of mere skill. It is not simply giving expression to a fact, no matter how skilfully done. A map may be a reproduction of facts, true and accurate in every detail, and yet not be artistic.

The idealization of the real.

The realization of the ideal.

That is art. But who can tell how to produce it? It is the innate longing of a human soul in its highest efforts to bring forth something that will thrill the beholder; speak to him in a way which no words can express, filling him with thoughts and emotions of the highest and noblest, lifting him out of the rut of every-day worry and care, making him live in the inspiration that stirred the artist.

Oh, yes, I know that this is an age of utility; there is no place for the dreamer in the mad rush for wealth; every energy must be used to gather the almighty dollar, and once having it, cling to it with the grasp of a miser. But we are beginning to see that there are other and better things. Of late there is a hint of disgrace attached to the man who is rich and does not use his wealth in an endeavor to aid and encourage those finer souls who have a spark of that immortal fire called genius, and this is the history of nations, particularly Republics. It was under a Republic that Venice and Florence reached their greatest art achievements. It was during the days of the Dutch Republic that the whole north glowed with the celestial light of painters whose names live to-day. Republics give greater opportunities for the acquirement of wealth, and the natural result is the substantial encouragement of the higher ideals.

So much for cause and effect. Now for a better understanding of the fickle goddess, Art. How shall we understand her moods and know just what to do to please her?

'Tis early morn ; the birds singing in the trees arouse you from heavy sleep; do not turn over saying to yourself: "A little more slumber, a little more rest," but for once get up, go to the window, roll up the curtain. Have you ever witnessed a scene in any theatre like this one you look upon? Everything about you is in mist and shadow, no detail visible anywhere. The sky is a dark purple, while as you gaze a pinkish glow spreads over the east, veiling the distant hills in a fascinating haze; now the shadows assume form and lengthen; glints of sunlight appear here and there, making the dew-covered grass sparkle as if sprinkled with a million diamonds. What a glorious picture—one which man through all time has striven to reproduce! This is one of Nature's golden moments, in which she only half reveals her charms, and it is that air of mystery which is so enchanting.

The sun mounts higher and higher, bringing out every detail; the mountain side, a short time ago so beautiful and blue, shows a scarred face of rock and barren sides, where the hand of man, for gain, has robbed her of her trees and slabs of rock; nearer there is a great gash, where the potter has claimed old mother earth for his handicraft; and still nearer a giant oak has been struck and withered by the lightning's flash. In the glare of the noonday sun I see all these things and sadly realize that Nature, like man, under the limelight, is not beautiful ; no, this is not the line to take or make pictures ; we cannot conceal the faults and blemishes, and you pull down the curtain and shut out the scene. Now the day's work is done you recall the incident of the morning, and again the curtain goes up, the shadows have again lengthened—there is a warm haze over every tree and shrub; the mountain is again blue or purple; the afterglow of the dying day has drawn a silken veil over the scene, hiding all the scars of the noonday sun; the trees stand like gloomy sentinels guarding the picture. In the west the god of day, with flying banners of many colors, marshalls his hosts to bid farewell to the world; and the moon, jealous of envious eyes, draws the mighty purple curtains of the night and pins them with a star.

Thus Nature hugs her secrets tight within her breast, revealing them only to those who woo her day and night, who watch her every mood, that now and then they may catch a glimpse of her wondrous beauty and transfix it so that others less fortunate may also see it.

Do you see the application ?—not Nature, nor man, nor woman, as they are—but as those who love them know they are, not their blemishes, faults, failings—all brought out under the glare of a harsh, ill-favored light—but softened, subdued, veiled if you will, until we see in their portraits only the better side—the good they have done, the sacrifices they have made, the battle of life fairly won; the one touch of Nature that makes the whole world kin, that intangible something that is art, because it comes from the best that is in us. You say a camera will not do this. Make it a part of yourself, and, like the artist's brush, it will do anything you will it.

A New Born Day. W. F. Provo.

# The Latest Designs in Snow and Frost Architecture.

*By Wilson A. Bentley.*

THE various provinces of Nature's realm so closely adjoin one another, one in part bounding another, that one can hardly enter into or approach the boundaries of one without catching glimpses of the glories and natural treasures that lie within those that extend around about. Hence it happens that the deeper one enters into the study of Nature the further one ventures into and along the by-paths, that, like a mystic maze, thread Nature's realm in every direction, the broader and grander becomes the vista opened up to the view.

Unsuspected by-paths are continually being found leading out to new regions, and to a fuller knowledge and enjoyment of the beautiful and wonderful in Nature, and of the working of those marvellous natural laws and processes which evolve such wonders all around us, and that bring forth such infinitely varied creations from seemingly dead and inert matter.

This has proven true as regards the study of the snow crystals.

These masterpieces from cloudland proved, upon close acquaintance, to be so exquisitely beautiful and so varied in form and structure that the study of them naturally led to the query: What of their next of kin, the frost and ice crystals? Are they in any degree as beautiful and interesting and varied as are their cousins from above?

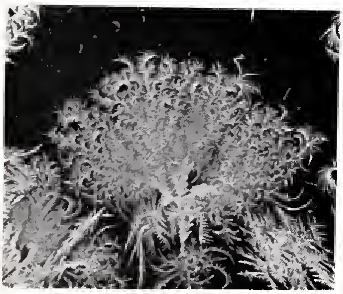
The answer has been found to be in the affirmative, as many readers of The Annual may know, for this and some previous numbers of THE ANNUAL contain some charming likenesses of these latter forms, in addition to those of the snow crystals.

There is, indeed, a world of beauty and interest not only in the snow, but also in the ice and the frost. The crystalline forms of the ice in particular have been found to be, at least in part, much more varied and beautiful than they were popularly supposed to be. Certain types, indeed, closely resemble and rival in beauty of outline the snow crystals themselves. It has heretofore been impossible to secure satisfactory photographs of this latter type of ice. We have reason to hope that all difficulties will be overcome, and, if so, perhaps some future number of THE ANNUAL may contain reproductions of these charming ice creations.

### SNOW PHOTOGRAPHY.

The winter of 1905 was noted for the number and beauty of its frost and ice creations and for the length and intensity of its cold waves, rather than for the beauty of its snow crystals, or the number of its favorable snowfalls.

Yet some fifty tiny cloud-born beauties winged their way down through the vapor shrouds that the blizzards from time to time wave above the earth and alighted upon the ebony surface of our waiting board, and tarried here below for a sufficient length of time to give us successful photographic sittings.



Some twenty-five of these evanescent jewels proved to be very fine, or odd and interesting, so that we were delighted to add their photographic likenesses to our already numerous collection.

There were but five favorable snowfalls (at our locality, near Burlington, Vermont) during the winter of 1905. The storms of January 18th and of February 28th furnished some very odd examples of crystal architecture. The one of January 21st furnished a profusion of very perfect crystals, possessing very delicate internal features.

It was a rare pleasure, indeed, to examine each and every one under that magic instrument that we call a microscope.

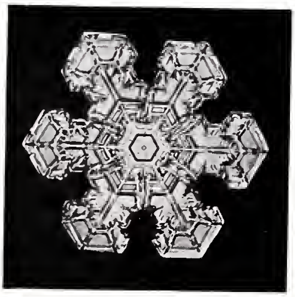
On one occasion (January 22) Nature's crystal builder seemed to be possessed of a very fanciful mood, indeed, for the clouds showered down to earth a glittering host of very odd, unusual crystals. It would, in fancy, seem as though the snow architect had for once tired of the rule of six, and built accordingly upon new plans, for many of the crystals were bisected into two parts, or were constructed with two, or with four lobes.

### FROST AND ICE PHOTOGRAPHY.

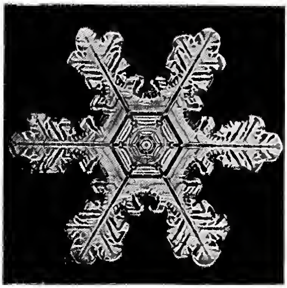
Our collection of frost and ice photographs was greatly augmented during the winter of 1905. Some 130 photographs of such were secured, and so beautiful and interesting were many of them that they made up in large measure for the paucity of the snow crystals. The window panes indoors, and the shrubs, trees, and objects under the open, were often enriched and beautified by wonderful fairy-like canvasses, or sparkling frost jewels. Moreover, they often formed in strange and unsuspected places, and in nooks and crannies usually overlooked.

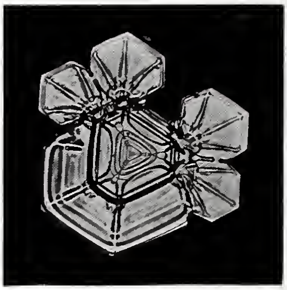
Cavities in the snow, or beneath blocks of wood, etc., imbedded in the snow, and the crannies between the barks and trunks of old trees, etc., etc., were often found to be beautifully encrusted with frost gems, and the long-continued cold even transformed the snow granules beneath the crust (by a process of evaporation and recrystalization) into glittering facetted jewels. All of these and many other sources were drawn upon to enrich our frost and ice collection. Many of these creations of "jack frost" make very beautiful and interesting pictures, indeed; yet these pictures fail to depict all of the exquisite loveliness of the originals.

How inadequate our present photographic methods and processes are to fully depict the beauties of the frost and ice and similar crystal creations in the photograph. The gleam and glitter and changing opalescent tints that appear so beautifully in the originals is nearly all lost in the photograph, and those greater beauties that are due to their environment or setting, or to the fact that we view them as part of a perfect and fairy-like picture, is lost or but imperfectly reproduced by our present photographic methods. Yet we would fain have it otherwise, for could we but fully reproduce and express those other and "greater beauties" in the photograph: "The moonlight shining through or upon a frost bejewelled window pane, or the gleam and glitter of the frost of a 'frosty winter morning' when Nature appears transposed into the semblance of fairyland, or that still grander picture, a moonlight winter night scene, when, after a snowfall or deposition of frost upon the snow, myriads of tiny snow or frost stars flash out from below, under the silvery moon, vieing in brilliance with those that stud the blue vault above, and when there is indeed 'a firmament above and a firmament below,'" how grand and satisfying would such pictures be!

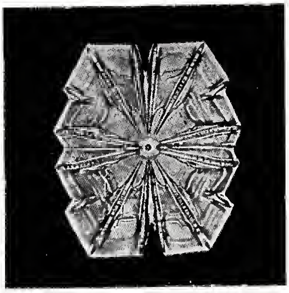


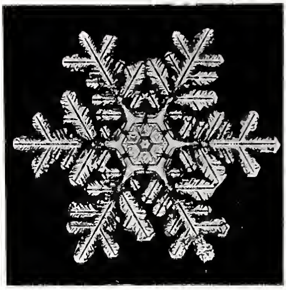
But the art science of photography is yet in its infancy, and perhaps a time will come when these and other subtle and intangible beauties within Nature's realm, such as the glories of the sunset sky, the gorgeous tints of autumn, or





the wild beauty of that grand natural phenomena that we call a thunder shower, may appear in much greater fullness in the photograph than is now the case. But however that may be, the fairy-like crystal creations that we ascribe to "jack frost's" efforts will, as heretofore, continue to be





a source of pleasure and delight to many during the long cold winter, when "frost is king," for they are of exceeding interest, both in the photograph or when viewed in the originals. Perhaps this brief sketch may serve to once more call attention to these charming objects of Nature.

WHISPERINGS

H. W. Minns

# The Camera in an Old-Fashioned Garden.

**By Daisy Wilson Adams.**—*With Illustrations by the Author.*

I TOOK the first photographs of my *new* old-fashioned garden before ever it was laid out! I wanted to have a complete record of the garden's growth and development from the very first. So I photographed the good brown earth and the old tumbled-down wall, with its wild native vines and bushes, just as it was before we started to make our garden.

When the large new wall was built, with its large stone steps leading from the lawn down into the garden, and the lower walls on two other sides were laid up; when the paths were all laid out, and the flower and seed beds were actually made and planted, I photo, graphed my garden again, and there was quite a difference in the two pictures.

Then my plants and seeds began to grow, bushes and flowers were transplanted, vines commenced to run over the walls, the rustic entrance gate and the trellis over the stone steps; then I made my third series of prints. This time they began to look really like pictures, and they made a most interesting addition to my collection of progressive photographs.

Later, when my seedlings were transplanted to the border of the garden, and the decorative iris, fox-glove spikes and hollyhocks showed above the low vine-covered walls, I found I had some subjects for the camera which were really very beautiful, and I wished for the process which would enable us to preserve them in all the glory of their original coloring.

The Stone Steps.

The Rustic Gate.

I now photographed the borders in picturesque sections, showing masses of flowering growth ; also the dense lovely corners, where golden glow and the larger plants loomed up luxuriantly behind, while old-fashioned white phlox, China pinks and sweet-williams showed in the foreground.

Thus from season to season and from year to year I have lovingly followed the growth and development of my old-fashioned garden, carefully preserving all the good prints for my garden book of photographs, where I often find delight in looking them over. Especially is this a pleasure when absence from my garden makes it impossible to enjoy the dear flowers themselves, or when the soft protecting snows of winter are hiding them from all sight.

Old-Fashioned Roses.

This year we are constructing a rustic cedar pergola at one end of the garden, which is to be protected from the north winds by a grove of native spruce trees, transplanted from our own New Hampshire woods. On the garden side, in the centre, will be the sun-dial mounted on a vine-covered pedestal of local moss-grown stones. When the woodbine, wild clematis and hop vines have grown over the pergola, I shall have another very pretty subject for my camera, and this will mark still another development of the old-fashioned garden.

But for these photographs, I shall have to wait until another year, and perhaps then I shall have some others also to send you.

One of the Borders.

SUNSET GLOW. JAMES W. KENT.

# With a Camera: How To Get the Most Out of a Day's Outing.

### *By Hugo Erichsen, M. D.*

ACCUSTOMED to early rising, my oldest daughter and I experienced no difficulty in catching the seven o'clock car of the Orchard Lake Division of the Detroit United Railway, one glorious day last summer, just as the sun was getting his bearings for his daily trip to the western horizon. The journey from Detroit, Michigan, was uneventful, and, as the road traverses a sandy region, somewhat monotonous. But the nearer we drew to the lakes, the more interesting the scenery became. Soon hills alternated with vales, then the landscape became more densely wooded, and finely the conductor bawled: "Orchard Lake," and gave us barely time enough to alight at a rather primitive depot. We had made the twenty-eight miles in an hour and a half. At this point the electric line separates two lakes, Orchard from Pine. Oakland county, in which these are situated, might be aptly termed the lake county of America, for it contains 450 lakes, including the above mentioned. The total area of these lakes is about 20,000 acres, the number of square miles in the county being 900. This gives a lake to each two square miles in the county's surface, a condition unprecedented, I believe, in any other part of the United States.

At Orchard Lake we inspected the Michigan Military Academy, established by the late Colonel J. S. Rogers, an ex-United States army officer, about 27 years ago. The cadets were away and only here and there a workman was engaged in setting things to rights against their home coming. The deserted buildings produced a depressing effect, so we stayed no longer than was necessary to photograph the main structures.

Pine Lake is truly beautiful. As soon as I beheld the vision of its loveliness, I unlimbered my camera and soon had the lens trained on the landscape, ready for action. Elsa claims that is my way of expressing admiration.

We caught the 9:30 o'clock car to Pontiac and in less than ten minutes were deposited at Cass Lake, which is two and three quarter miles long and a trifle over a mile wide. Here we remained just long enough to take a snap-shot and to enjoy the antics of a trio of boys, who were out wading on the sandy beach and had overturned a boat in an effort to dislodge one of their number.

PINE LAKE. Hugo Erichsen.

At Sylvan Lake, our next stopping place, our attentions were divided between the attractions of the scenery and those of our lunch box. Feasting on nature alone does not satisfy the inner man.

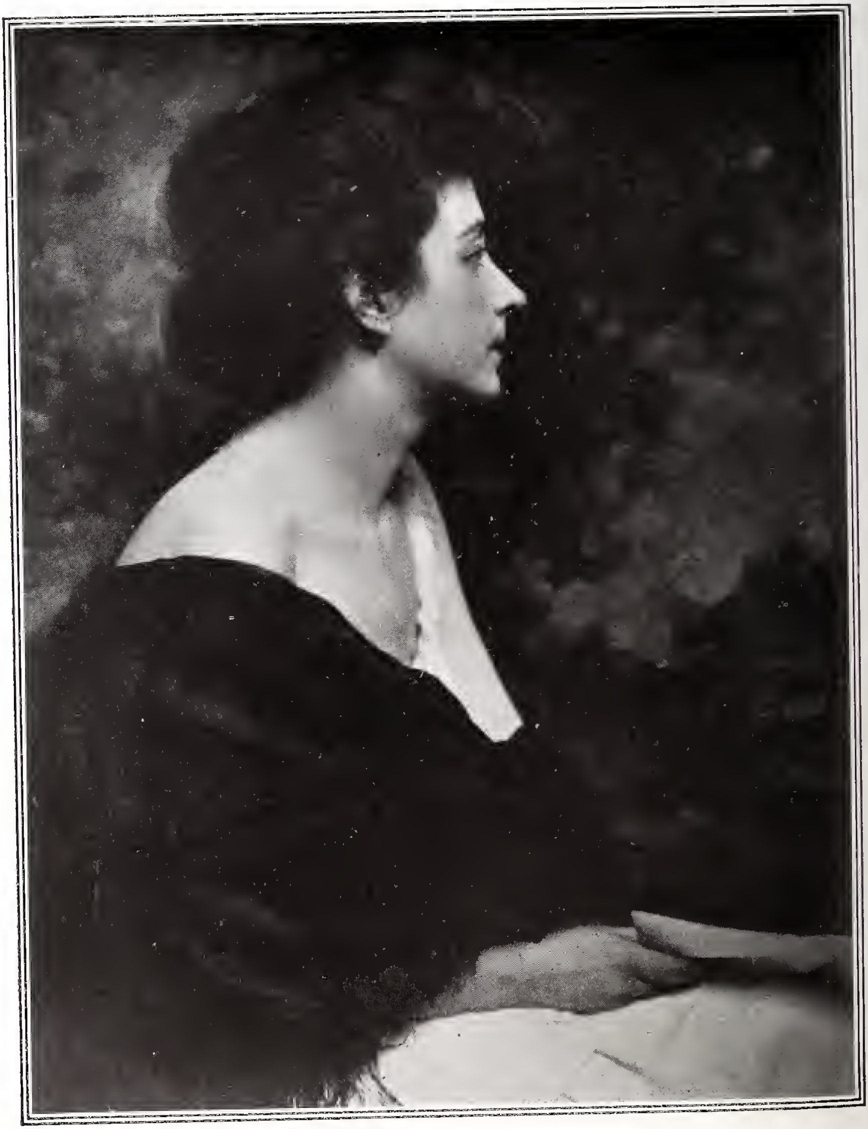
The car that had the privilege of conveying us to Pontiac reached that city at 11:55. The thing we most vividly remember Pontiac by is a long counter in an up-to-date drug-store, at which we imbibed delicious ice-cream soda.

The 12:30 p.m. car of the Oakland Railway, another electric line, bore us southward, back to the City of the Straits. On the way we stopped at Palmer Park, just on the northern boundary of Detroit, where I proposed to take some photographs. To this Elsa, who carried one of our cameras, objected strenuously. She said she was carrying enough scenery around with her already and that the addition of another view or two would make the camera too heavy, an objection that was, of course, promptly overruled by the parental authority.

The park was named after Hon. Thos. W. Palmer, ex-Ambassador to Spain, the gentleman who presented it to the City of Detroit. A log-house, situated in the beautiful grounds, was formerly occupied by Mr. and Mrs. Palmer during the summer months and is now the repository of an interesting collection of colonial furniture and utensils. After duly inspecting these, enjoying a stroll through the grounds, and taking a number of snap-shots at the ornamental lighthouse, the old Spanish bell, and other picturesque sights, we again boarded the inevitable electric car that whisked us down the White Star Line dock in ample time to catch the three o'clock boat for the St. Claire Flats.

PINE LAKE. Hugo Erichsen.

The trip up the Detroit River, past evidences of the city's enterprise in commerce and industry, then along the



PORTRAIT OF A LADY

J. C. Strauss

Canadian shore in plain view of the British flag flying over the Town Hall of Walkerville, Ont., and finally past the verdant beauty of Belle Isle, is always interesting. It is followed by a monotonous journey through Lake St. Claire, a sort of a preparation for the pleasant surprise that awaits the tourist at its termination. But when the land passes out of sight, I must confess that I cannot wax enthusiastic over an expanse of water; there is some subtile affinity between myself and the late Antaeus.

After an enjoyable ride, we reached the "Flats" through Uncle Sam's famous ship canal. At this point the lake swells out to a width of thirty miles. The water is alternately shallow and deep and covered with tall rushes, intersected here and there by small channels of clear water. This is the paradise of the fisherman. With its cottages, hotels and club-houses, built on piles, the "Flats" presents a spectacle unequaled in the United States; it is truly the "Venice of America."

U, S. Ship Canal. Hugo Erichsen.

A toothsome fish dinner at one of the hotels preceded a homeward journey through the splendors of the rippling moonlit waters that fittingly concluded, as Elsa aptly expressed it, a day on which we did not merely exist but actually lived. The entire distance covered by rail and water, exceeded one hundred miles, the total expense of the novel experience being but $3.75.

"THE PATHS OF GLORY, LEAD BUT TO THE GRAVE." Jos. R. Iglick.

# My Camera. *By Frances Voitier.*

*An Article written August 18, 1950.*

IT'S not so queer-looking after all! In outside appearance, not unlike many of the cameras in the market in 1906. At any rate, whatever queerness there is about it is not apparent to the average observer. As to size, the outside dimensions are 6 x 8 x 2 inches, and it takes a picture 5 x 7 inches.

The camera is of the magazine type, having no bellows, these being obsolete owing to the fact that the lens is of universal focus. This up-to-date instrument is made of aluminum, which renders it very light, and is covered with black leather with no bright parts visible, which makes it unobtrusive.

As for the shutter, it does not differ very materially from the well-known focal-plane introduced years ago. With the exception of the blind, however, it is made of aluminum, and is equally adapted to fast and slow exposures. The shutter which works at all speeds up to and including 1/5000th of a second, forms a part of the camera proper, and is neither bulky, heavy nor obstreperous; in fact, it works every time and all the time without possibility of failure.

There are two diminutive buttons and a small thumbscrew located on the right hand side of the camera, all of the same color as the box itself. Slight pressure on one of the buttons releases the shutter, while an equally gentle pressure on the other causes a new film to run into place, a movement which always results in the automatic resetting of the shutter. A right and left turning of the thumbscrew regulates the width of the slit, which can be effected whether the blind be up or down, while the drawing out or pushing in of the screw increases or decreases the speed at which the blind travels.

The lens is the invention of a German, and is called the "Grunstigmat." When I tell you that it is of universal

FAIRY TALES. HELEN W. COOKE.

focus, perfectly free from astigmatism and the other defects that manufacturers for so many years have been trying to overcome, and has a focal length of 12 inches and great depth of field, you can readily appreciate that the inventor of the "Grunstigmat" has risen head and shoulders above the laws of optics as understood in the past. Furthermore, 'this objective has so large a working aperture that I can make snap-shots of a theatrical performance with no greater illumination than that found in the average playhouse. Moonlight pictures with an exposure of one-tenth of a second are also within the range of this ingeniously constructed lens, and with its aid, in conjunction with that of the improved focal-plane shutter, I can eliminate movement from the rapidly oscillating wings of a nearby flying bird traveling at full speed.

In the place of a finder, the apparatus is fitted with sights, the position of the object to be photographed being noted by holding the camera at the level of the eye, an arrangement that obviates the chances of including too much foreground, as is easily possible when the instrument is held sufficiently low to observe the finder image.

My camera uses films only, plates being no longer manufactured. While the films are in the old-time but perfect cartridge form, they are ten times as fast as those obtainable fifty years ago.

The black paper that is wound around the film is also an entirely different proposition to what it was in 1906. Incorporated in the paper is a preparation called "Instantol," the special province of which is simultaneous development and fixation of the film by simply immersing it (together with the paper, in clear water. Furthermore, this operation is done in broad daylight owing to the presence of a coating of coloring matter on the film which prevents further light action. Then, too, the "Instantol" does its work in a remarkably short time, a little over five seconds. One minute's washing in an 87 per cent. solution of another preparation called "Hypogo" removes every trace of the fixing agent, and a subsequent immersion for twenty-five seconds in a 10 per cent. solution of "Instandry" insures the complete drying of the film in half a minute. In other words, I can develop, fix, wash and dry a roll of film in two minutes.

Take it all in all, I think my 1905 outfit remarkably perfect in all its details. With it I can handle work that would have been impossible half a century ago, and, what is more, I am ready to take a print from a dry film two minutes after making the exposure.

ENTRANCE TO MUSKEGON HARBOR. Charles Vandervelde.

A CHRISTMAS SCENE IN THE FAR SOUTH. J. H. TARBELL.

# The Call of the Wayside.

***By Gene Stratton-Porter.***

*Author of "The Song of the Cardinal," "Freckless," etc.*

HE straight way is the same old way which I have traveled since childhood leading into the heart of birdland. The task is the same old task, joyous as always, seeking character studies of birds and bird life. The methods are the same old methods as to cameras, paraphernalia, ways of approaching subjects, and the development of negatives and the making of prints. The results, as become long practice and painstaking care, are just a little better each year, experience teaching her lessons, repetition making easy seeming impossibilities.

It is the old story of the old loved work, as it has been told and retold in The Annual of the past four years ; but the story which has not been told is the story of the call of the wayside attractions which lure me from the straight path ; the story of things which confront me, and by right of their beauty and because they are a part of wood-life, compel me to set up cameras and put on record subjects for which I really do not go afield.

It is the story of the robin, still wearing the spotted shoulder cape of the unmated, which comes nearer and nearer to investigate what I am doing in his neck of the woods, until I swing the camera from the nest on which it is focused to his location and snap him, as with sleek feathers and wings tense with restrained impulse to flight, he lingers near me.

The wayside call comes in the rattle of the kingfisher racing down the river, and with trembling fingers I hurriedly set up a camera and await him. Surely he will pause on his favorite stump to prospect for minnows which run the shoal beside it. As he flashes by, with his great black beak, his big liquid eyes, his snowy collar, and his back of heaven's own blue, experience gives me the right to hope that by the wayside I have gathered to myself a treasure.

Then there is the day on which I wait by the hour along the river bank, my camera focused on the nest of a bird, my nostrils filled with the damp, cool flower-perfumed air; my ears entranced by a babel of bird notes, coming so thick and fast, I scarce can pick my favorites; my eyes aching from a steady watch of sky, trees and bank for the bird I hope to picture; and in the midst of it I find them held fast, feasting, resting. There, opposite, in a solid mass, grow succulent frosty stems bearing exquisitely cut leaves, buds rarely peculiar in shape, and great blushy pink blooms larger than a hollyhock and twice as beautiful. I begin softly to pray that my bird will make haste before the light is gone, for "The bird of time has but a little way to flutter, and the bird is on the wing," and the mallows are calling me. I know that call, and that I dare not long delay the answer lest trampling stock, lumbermen, or some woodland tragedy destroy my subject.

THE CALL OF THE WAYSIDE.

"Surely he will pause on his favorite stump to prospect for minnows which run the shoal beside it."

No matter how long I have waited, no matter how tired and hungry I am, the minute I have made the exposure on my bird I wade the river and make another on the mallows as they lean, blushing at their reflected beauty. I have no place in view in which I want to use them, I don't know why in my busiest season I stop for them; but their call was irresistible, I have them, and surely the day will come on which I will want very much to use them.

"The invitation which lies in the shadowy gleam of big pickerel slowly gliding among the moss and rushes makes me add to ladders, saws and hose, the stout line, hook and bait box."

By the river, to the heart of the true nature lover, no call comes louder and more frequently than the call of black bass, so full of life and exuberant spirits, they cannot always keep under water. The invitation, which lies in the shadowy gleam of big pickerel slowly gliding among the moss and rushes, makes me add to ladders, saws and hose, the stout hook, line and bait box. When a decent person's share of these temptations lie stretched on the grass, the spine snapped where it joins the head before removing the hook, I arrange them. Have I ever touched surroundings with more reverent care? The river bank must be damp, mossy and fern-covered, where it forms their bed. A place must be found where the sky is almost cut off by beautiful growing things. The light must fall clear and strong, and my fish must be placed to show their greatest length and breadth, and the bird which comes close enough to turn my camera before the eyes of my study grow sunken and dim must be a rare bird and perch compellingly near.

The Call of the Mallows.

"Great bushy pink blooms, larger than a hollyhock and twice as beautiful.

Bridging the river are crude old driveways, which call me; through the fields flow flower and willow outlined streams. In the swamp, I need eyes carefully trained to follow the invisible path I have found safe to the home of my subject. A few inches from a certain course and I strike muskrat burrows and go in overhead.

The growing arch above my bird, its nest of tan, its delicately colored and mottled eggs, and the bird itself, as it carefully tucks an egg from sight, form pictures of beauty to fill and hold the eye and heart.

King Rail Tucking an Egg from Sight.

A Haunt of the Rail.

But one day after the nest is vacant, after the eggs of which I have made a study, each have yielded one of the young rails which now race between the corn rows, I look over the series and find it incomplete. Something is lacking. For a time I am bewildered. I thought I had that for which I planned. I close my eyes in a flashing mental inventory, and then it comes to me that I have not answered the call of the swamp. So I go back to the haunt of the rail, to find the water low and black, the cattails ripe, and the young rails, large as their parents, feeding among the golden shocks of corn. I enter the swamp from the opposite side and make a study of the path by which I reached the rails' nest; the call is answered and I am satisfied.

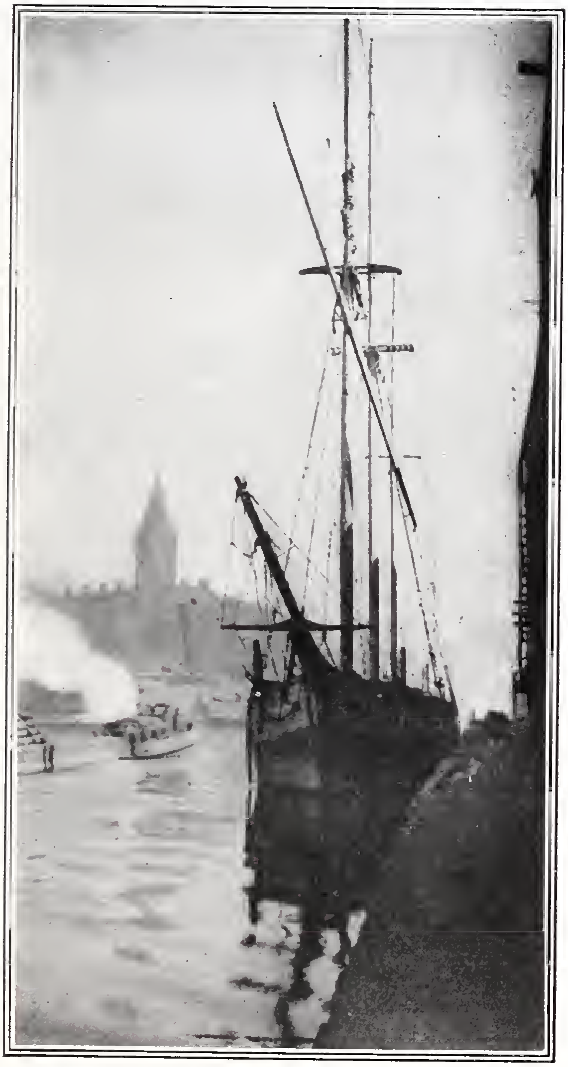
"Through the succulent sweet grass comes a beautiful Jersey on her home way."

All young things call me. Constantly I find myself turning to the barnyard and the pasture. When a whole flock of baby ducks come racing to take possession of a puddle at my feet, loud indeed must be the call of any bird which keeps me from stopping for a wayside snap at them as they race to the loved water to drink, swim and dive.

The day may have been long and hard beyond all expectation and the homeway the most welcome road of all, but as I approach the village the marsh catches my eye—one undulating sea of variegated green; the millrace mirroring the swamp grass and rushes bordering it until they appear to grow down as well as up, each shimmering fleecy cloud repeated in the water, and trailing across it an image of each passing bird. Back through the succulent sweet grass comes a beautiful Jersey on her home way. Instinctively I mark the spot where she will cross the millrace, and before I have time to remember that she is not a creature of flight and feathers I am shoulder deep in the marsh, my camera ready, and the picture which called me goes home on my plate. It is only as I strive to extricate my feet from the muck and entangling grasses that I remember having seen six big massaugers in that pasture at haying time the previous season.

A Whole Flock of Baby Ducks.

With the greatest love of my heart I answer the call of the straight way, but that call must be rare and insistent, indeed, if it prevents me from responding to the call of the wayside.



ALONG THE QUAY. Robert E. Weeks.

# Fads.

*By C. M. Giles.*

THIS somewhat modern word seems to have rather crowded out and replaced the older and more expressive word hobbies, which latter I like better. A fad seems to imply something more inconsequential and shortlived than a hobby, and its possessor seems to take it less seriously. In fact it used to be said that some possessors of hobbies let the hobby become the equestrian instead of the steed. The possession of a well developed fad, or hobby, if it is well chosen, is a useful adjunct in any well ordered life. To have its best influence it must of course be adapted to the temperament, environment and other conditions of its possessor. It is generally accepted as a fact that one of the most valuable of the modern fads is that of amateur photography and one with the greatest possibilities of educational influence. The principal trouble with the average of amateurs seems to be that the vast majority of them fail to grasp its vast possibilities for practical and educational purposes. The ease with which a more or less cheap "box" can be secured and loaded, the button pressed, and some one paid to do the rest, affords a combination which the average person finds irresistible. It is well, perhaps, to admit here that very many are prohibited by various circumstances beyond their control from enjoying photography under any other conditions, and I would be one of the last to suggest their being deprived of the enjoyment and advantages to be obtained

THISTLE-DOWN.
Louis Fleckenstein.

by even this small participation in the making of the picture. But it seems strange that more of the beginners, having wandered thus far into the field, do not see the great opportunities lying just beyond, and determine to let no one have any part in the making of the picture that it is possible for them to do for themselves. It is only thus that they can secure the fullest enjoyment and profit. Then it becomes a fad well worth having. I think that any one who has tried to follow photography as far into the mysteries of nature as it could lead them will testify that the mere "taking" of pictures is among the least of the enjoyments of what so many find a fascinating pursuit. Much of that marvelous science, chemistry, is involved, as well as optics and kindred sciences. As to whether art is involved it is unnecessary to revive the multitudinous controversies the suggestion has caused; but certainly it awakens, stimulates and trains the art instinct if allowed the right opportunity. To get the most advantage out of this delightful fad, carry it out of and beyond the domains of fadism and take it as a valuable and serious opportunity to enlarge what knowledge you may have of the wonders which surround us on every side.

Buy the best of everything needed, even if you have to buy less of it, select well known and thoroughly tested formulæ and directions and follow them implicitly, trying to understand the reasons which lie behind them and the results that follow them, persistently study cause and effect in all your operations, and you will find yourself in a land of delights. After you have mastered all the manipulations in the beaten paths, then launch out onto the broad field of experiments and there are abundant worlds to conquer. Thus will you find one fad at least that will well repay all your expenditure of time and money. Why and how this is so you can best know by personal experience. Be as open minded and inquisitive as a child and always be looking for the "Why" in every manipulation and so shall you find your greatest reward.

CORYDON G. SNYDER.

INVOCATION. CORYDON G. SNYDER.

# Control in Bromide Printing.

***By Henry Erle Cooper.***

IT is, I suppose, the common experience of the majority of photographers to at times obtain negatives which, when printed on ordinary paper with no attempt to vary or control the result, are a disappointment. This may be owing to over-density in the high-lights, to thinness in the shadows, or other similar fault in the negative which renders it a failure when printed.

The most important point in the successful printing of difficult negatives is that the photographer should have considerable if not complete control over the printing process.

It is generally understood that the power to manipulate and vary the result is confined to gumbichromite and papers of a similar class; it has, however, been overlooked that one of the most useful of development papers, bromide, lends itself without difficulty to the operator's control.

The advantages obtained by the use of bromide paper are many. The ease of obtaining supplies, and the low cost, the quickness in working, and the uniform results obtained are several points in its favor, whilst the varied tones that can be obtained by toning, ranging from a pure grey through all shades of brown to red, should prove sufficient to meet the requirements of any ordinary worker.

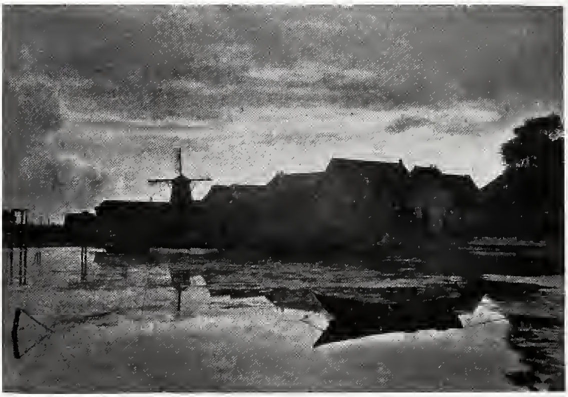
But the point that I think is worthy of emphasizing most in the bromide process is the way in which portions of the negative may be suppressed or brought out in the print by manipulation in the development.

Both in portraiture and landscape work such a power of control is extremely valuable, and the writer would suggest that the following hints as to *modus operandi* will be worthy of study and practice by the photographer who desires to have some control over his results.

No. 1.

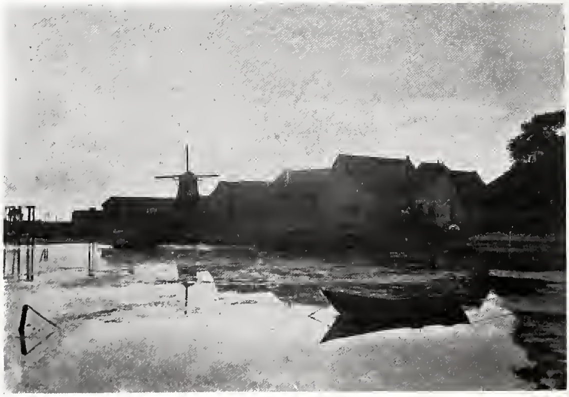
No. 2.

In the case of all negatives where it is desired to vary the results the full exposure for the densest portions of the negative should be given. The exposed paper, having previously been marked to show the top and base of the picture,



No. 1.

should then be well soaked in clean water several minutes and laid surface up on a sheet of glass, larger than the print, to drain. Two dishes of developer should be used, one normal strength and the other diluted with one-half



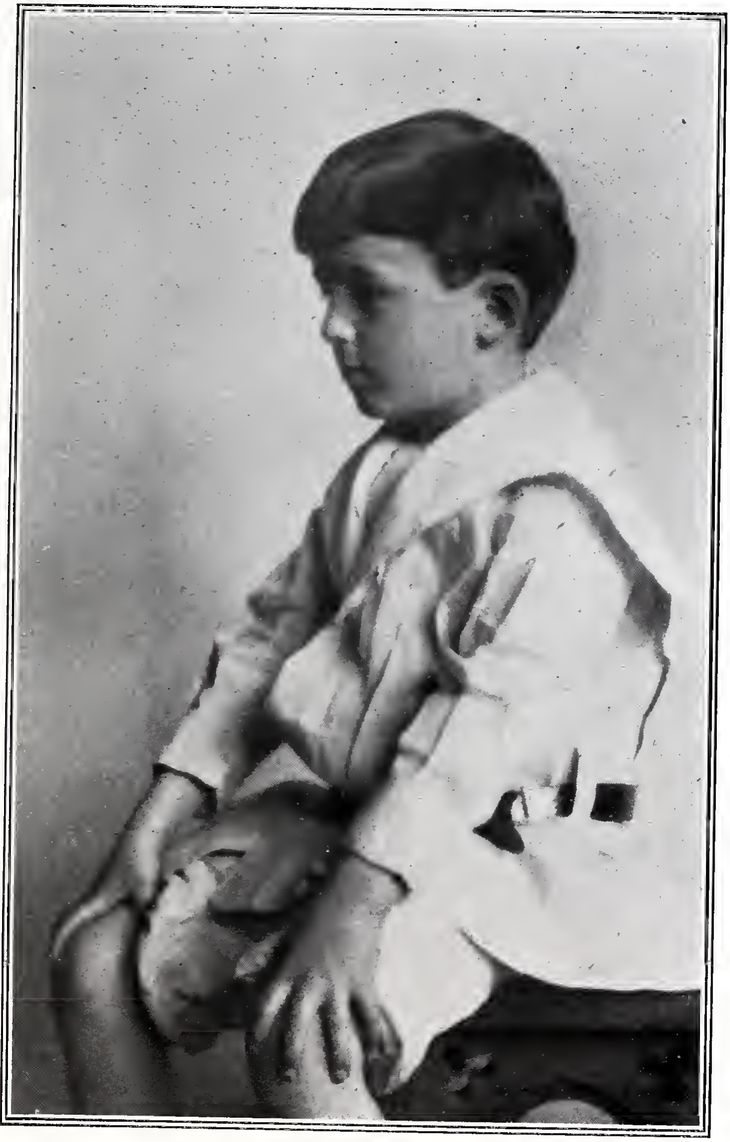
No. 2.

its bulk of water. The print should then be gently but quickly rubbed to and fro with the weak developer until the detail begins to appear, when it should be at once well washed under the tap or a stream of running water to remove all traces of developer; it is advisable to apply the developer first to those portions of the print which are the densest in the negative, and would otherwise be the last to appear; in the case of a landscape, where the sky or clouds is the feature that it is desired to bring out, it is desirable to turn the print upside down, and sponging the developer over the clouds bring them out first, allowing the developer to drain back again into the dish. Then, by careful application of the strong developer to those parts that are weakest or require strengthening, the print can be built up until the desired result is obtained. It should be borne in mind that the developer when it has once commenced its action works very quickly, and if it is desired to stop it it should be plunged instantly under running water several seconds before it has reached the depth required. Of course, some little practice is necessary before the operator can depend upon obtaining a desired result with certainty, and quick decision must be used as development proceeds, but as proficiency is obtained the photographer will find a new power in his hands.

In the case of very extreme density and thinness in the negative, before applying the above method, it is a considerable advantage to cover the front of the printing frame with several thicknesses of tissue paper, and by means of color work on the tissue opposite the thin portions of the negative and oil rubbed on opposite the densest parts, secure a much more harmonious result.

The accompanying illustrations, taken at random from spare prints, will give to the reader some idea of the improvement that can be effected by the adoption of this method of working with bromide paper, although it should be borne in mind that, owing to the tendency of process blocks to soften down the results, much of the difference which is observable in the originals is lost in the reproductions.

ASPIRATION. ADELAIDE HANSCOM.



JOHN.

OSCAR MAURER.

# The Human Figure in Pictorial Photography.

*By Henry Read.*

THANKS to the pioneer labors of a comparatively small band of workers, photography as a creative art has gained recognition where formerly its imitative power seemed the only reason for its existence. What place it may win for itself in comparison with older and more flexible methods is still a matter for speculation, and depends much upon the artistic strength of its exponents. Not alone knowledge of the resources of the craft and skill in its practice, but capacity for pictorial conception, and such training as art demands from the painter, must equally be considered factors in any solution of the question.

Whatever of thought or emotion can be suggested by the graphic representation of nature unites it by a bond of sympathy with human life, and no form of nature offers so fascinating an opportunity to the artist as the living figure.

To admit this does not imply that other views of the external world must yield in interest to a single aspect. Varied beyond measure are the attractions that determine the extent and direction of our energies, and no less varied our individual choice of occupation. Nevertheless, to one qualified to deal with the human figure, photography reveals possibilities that still await realization, and art holds the key to the situation.

What use the photographer will make of the model—from what point of view he will consider it, are matters that must receive attention before technical knowledge can render any material service. We may note, by the way, among recent examples of photographic art prints that suggest and sometimes reproduce, the characteristics of hand work, but interesting as the quality of manipulation undoubtedly is, we should at least refuse to accept it as a substitute for that sensitive personal expression of beauty in form and values which underlies the translation of ideas into pictorial language. But another, and not less important side of the subject, is worthy of comment seeing that so much of the figure work of the modern photographer lacks that feeling of spontaneous truth which can result only from insight on the part of the artist and intuitive response on the part of the model. Neglect of the latter condition appears to be a very prevalent source of weakness. Whatever may be the starting point of the picture, whatever the impulse or suggestion that prompts the embodiment in pictorial form of some incident, sentiment or effect, the photographer cannot escape from the stern necessity of first finding complete expression in a concrete form, which he can modify only to a limited extent by the exercise of his craft. If he attempts to take advantage of unconscious pose or gesture, his work will bear the impress of truth, but only by accident will it possess those pictorial elements of design which are reached by deliberate thought, and which are indispensable to the full expression of his theme. A disturbing spot of light, an unfortunate accident, an unpleasant line, after making every allowance for the resources of printing, may injure its value as a work of art.

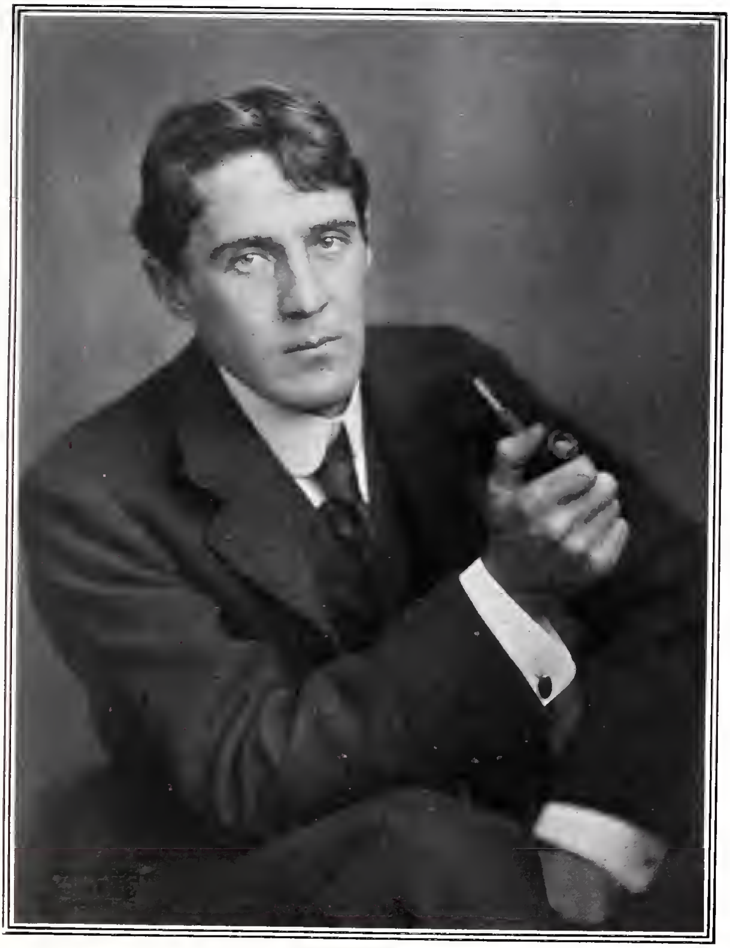
A readiness to seize and turn to good account the unexpected gifts of chance, is no slight addition to the equipment of the successful photographer, but it needs behind it the vital force of intention. If, on the other hand, by the exercise of his artistic judgment the photographer succeeds in obtaining an adequate arrangement, he will then face what frequently proves to be the more difficult task of dealing with the personality of his model, where a touch of self-consciousness, a trace of exaggeration, may give rise to a feeling of insincerity, which, perhaps, is less endurable than disregard of pictorial harmony. Under such conditions it will readily be understood what an important part is played by the model, and of what value is the possession of mutual sympathetic perception. Unlike the painter, the photographic artist cannot call memory to his aid, nor can he give form to the unseen.

But if he finds himself hindered by difficulties that do not exist for the painter, he is at the same time provided with a technical means of expression which, in certain directions, can be approached only by the work of a painter's lifetime.

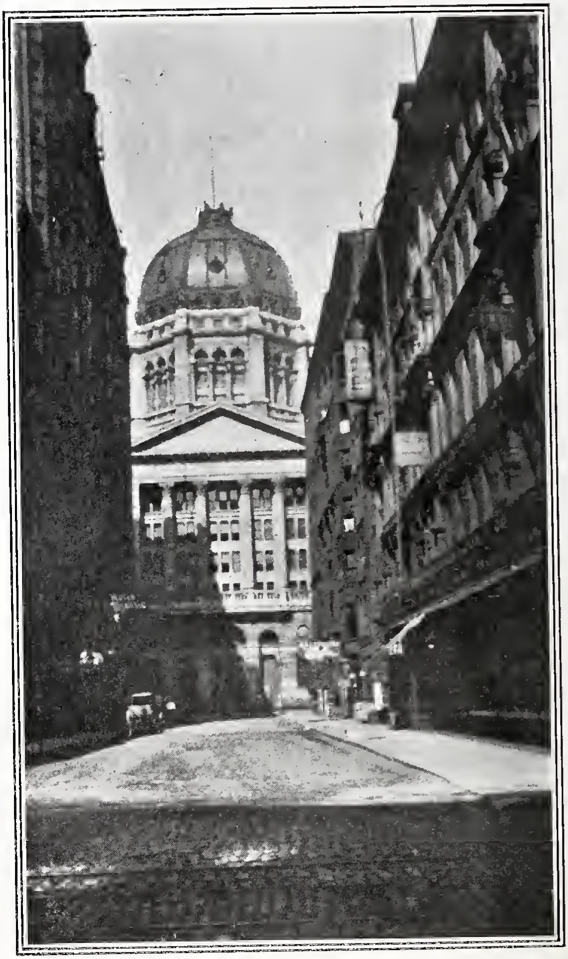
The most effective presentment of an idea being the first purpose of the photographic artist, it follows that, in the use of the model, superficial fidelity to nature must be the means, and not the end. Due subordination of the non-essential, both in conception and in treatment, becomes a necessity, and needs no further vindication.

To speak of the different ways in which this can be accomplished is foreign to the purpose of these remarks, it is needful only to keep in mind the fact that the appearance, pose, or gesture of the model may exercise a controlling influence upon that unity of impression which marks every good work of art.

It is by a close comprehension of what is fundamentally important in pictorial photography, and of the limitations that circumscribe his efforts to attain it, that the photographer will wisely direct his efforts toward the attainment of a result commensurate with his powers. But if he does not possess that instinctive impulse for pictorial utterance which dictates the sacrifice of time and labor to gain its end, photography offers many another field for the exercise of his skill with profit to himself and benefit to his neighbors. However widespread the appreciation of art may become, its visible embodiment in distinctively high achievement, will remain with the few.



PORTRAIT. MEREDITH JANVIER.



CHICAGO POST OFFICE. D. H. BROOKINS.

# More About the Carbon Process.

*By W. H. Porterfield.*

WHEN ONE has for a number of years pursued a certain occupation, be it either for pastime or as a means of livelihood, it is quite natural that an observing person will discover numerous ways of arriving at a destination by easier and perhaps shorter methods than those in general use.

It is the purpose of the writer in this article to enumerate a few discoveries, more or less original, which have been of material assistance in acquiring satisfactory results in the carbon process.

Perhaps no other process is so much written about, so much talked of, and so little used as this one; but gradually the amateur, casting about for a medium of greater pictorial expression, is commencing to appreciate its value, much to the advancement of the artistic in photography.

After the tyro has memorized the rudiments of any process, it may be said that the difficulties have just begun; the carbon process is no exception to the rule.

It is then that one must learn by his own experience, or the experience of others, who, having traveled the same road, "left footprints on the sands of Time that perhaps another, a forlorn and shipwrecked brother, seeing, may take heart again."

Since the negative is the logical starting place in all photographic work, and upon its manifestation depends the finished print, it is most opportune at this point to make mention of a simple way to get carbon prints of different tone value from the same negative.

It has long been known that to develop a plate or a gaslight print in a diluted or weak developer will give a soft print or negative, as the case may be. Now the same principle holds good when sensitizing the carbon tissue ; a weak solution gives soft prints ; the length of time of immersion in the bichromate bath also influences the print.

To get contrast from a weak negative it is necessary only to cut down on the time in sensitizing, for example : When the normal time would be three minutes on an average negative, one minute would be sufficient in cases where the negative lacked contrast.

While it is always advisable to have considerable strength in a negative from which carbon prints are to be made, it does not follow that good prints cannot be made from the opposite kind, which is something that cannot be said for many of the other processes.

One of the great objections to the carbon process has been the inability to work it in damp or hot weather, when the sensitized tissue would not dry in the required length of time. This annoyance can be overcome to a great extent by using equal portions of alcohol and water when making the sensitizing bath.

The alcohol being quicker to evaporate than water, permits the tissue to dry with greater rapidity than when water alone is used.

In the winter time there is no difficulty in drying the tissue—in fact, it may become so brittle that to handle it without cracking or breaking is almost impossible.

At this time of the year the alcohol would, of course, be omitted from the sensitizer and the full amount of water used, to which may be added one ounce of glycerin.

The glycerin will retain only enough moisture to prevent cracking of tissue, and apparently has no effect on the development of the print.

On account of the variety of colors obtainable in carbon tissues, considerable care should be exercised in their use.

HOMEWARD BOUND

R. E. Weeks

For instance, red chalk is very pleasant when used for certain portraits, or to depict a dusty road in the hot summer, but to use the same color for snow scenes would bring uncomplimentary criticism to the unfortunate pictorialist.

Dark blue or black may always be used with safety for winter scenes ; green often gives exquisite values for marines, and grey hardly has an equal where rain or mistiness forms the keynote of the picture.

To the one just beginning carbon work I should advise using black (platinum black) to start with. It can be used for all kinds of pictures, and, when proficiency is attained, more colors can be purchased, the most useful being engraving black, dark blue, sea green and sepia in the order named.

There are about ten other colors to be had, but it depends greatly upon the class of work one decides to do just which of the colors are most appropriate for the work, and when this question is solved it is then time to lay in a stock of tissue.

With reasonable care and attention the percentage of failures in carbon work should be very low, while the successful prints will possess a softness and delicacy of tone and color which is positively unequaled by any other process.

ROSES. CORYDON G. SNYDER.

MELODIES. H. W. MINNS.

# The Mission of Art. *By Harvey W. Minns.*

BELOVED ART, thou sacred mother of all that is beautiful born in the soul of man since he began to read the minor and major music of time from the dial of eternity, how shall I honor thee, how serve thee, how speed thee?

Thy spiritual children, born of a love too great to be measured by distance or years or bound by space, live and breathe and grow young when all material things have crumbled into dust.

Thy immortal truths are graven deep in the hearts of mortals to thrill with joy the hearts of millions yet to be.

Into thine attentive ear have been softly sung the lullabies and love songs too sweet and sacred for mortal ears.

Into thy sympathetic soul have been poured the heartaches, the heart-breaks and the sobs of sorrowing souls for ages.

Out from the mystic depths of thy hallowed canvases peer wistful, tender eyes, full of a yearning to express unspoken and unspeakable messages.

From quivering lips, that thou hast made immortal, we seem to hear the words which mortal tongues have never dared to utter, and into thy sculptured forms are carved lines of spiritual beauty, seen only in the ideal, the artist's conception of the immortally beautiful.

On thy pages we have recorded friendships more beautiful than Death, for he comes not, though we call him eagerly and woo him ardently, we must compel him if we await not his coming.

The mission of true art, then, is to perpetuate the eternally true and beautiful born in the soul of the artist.

A Dreamy Morning. H. W. Minns

And the great souls who have given to the world its masterpieces, seem to have but one word forever ringing in their ears, and that one word—Eternity!

And the artist of the glass who would join that company must also feel within himself that one same cry.

It has been the word that held the heroes of the world since history began.

All high ideals of art, like those of love and life, have first received the censure, the condemnation of those who admire the common place and traditional gods sacred to the multitudes.

Opposition and derision greets the overmaster of set rules and lines of expression; this is followed by concession, then approval and worship.

Idealism is the realm of the true and the beautiful toward which all are looking and working each in his own way and after his own conception of the ideal, if individuality has any place in a character.

The thoughtless and inane follow the crowd to its death. When the ideal of to-day is realized we reach for another higher and better.

It is this reaching out and longing that marks man's evolution expressed in Thompson's "Infinite Progression."

The robin builds its nest just as it did centuries ago. Man builds and destroys and again conceives new forms in his desire to express what is within himself.

Art is the harmonious expression of a thought or a feeling. And so much depends upon the word harmonious. The discordant note in music is detected at once by the trained ear of the musician. The discordant things in pictures are known only to the trained mind and keen feeling of the artist.

Only in perfect truth can harmony be found. A false rendering of a part mars the whole.

Simplicity, the soul of art, is cumbered with petty detail of material things.

The mission of art to beautify life finds a limitless field. Its upward unfolding marks man's progress from the barbarous to the most spiritually developed soul.

In man's industries it plays a master part. The wheels are set in motion by the ideals of the artists, the creators. From the evolution of the book came the shelf to hold it. the bookcase, the library, private and public.

From designs of the artist grow the beautiful material forms and patterns that greet the lovers of the beautiful everywhere. The word "Artistic" is used to enhance the price of every article in trade.

This is a sort of homage that vice pays to virtue.

True art applied to fashion would make the commonplace beautiful. A world opens to us in this direction. Let fashion become an art encouraging goddess with less greed and more intelligence.

Art applied to photography is a child of only a few years. The young thing has a noble field in which to grow, and a tedious task to correct the false lessons taught in the past.

Artists have regretted the acceptance of the belief that the photograph is a truth. The horrible fact stood as relentless as Life, and the man who saw the product of his lens stood by that fact as though his eternal salvation depended on it; though it did not correspond to one thing his own eyes had ever seen.

Ignorant of the revelation that a score of facts might be one great untruth the work of demoralization went on.

Professional photographers intent on material reward ignored both truth and fact, turned out insiduous things as meaningless as phrases and more misleading than mirage. All this has so poisoned the confiding public that the work of creating a new and wholesome atmosphere in which true art may live seems at times almost hopeless. Yet it must be done.

Truth however crushed must live at last.

"A mechanical process," is the one objection most often raised to crush the enthusiast of the new school.

The brush and chisel are machines much like the simple lever, the foundation of all mechanics, and in the hand of unskilled, unfeeling men, produce no delicate work.

It was the soul of Michelangelo that produced the one David.

Any tool is only a means to an end, like words to protray ideas, and arranged to express and produce feelings.

Back of every work stands the man who produced it and into it he wrought a part of himself and his life.

Life with its unspeakable joy that is more than half pain, and its speechless sorrow that is sweeter than happiness.

In his life he has felt that human blood is the ink with which the honor of the warrior is written. He feels the one joy and the one sorrow that runs the whole world round.

In his art he appeals to your life for the verification of the depth of his own. Its lights and its shadows, its joys and its sorrows, its hopes, its despairs, and the mysterious "Why?" "And the whither and whence?"

To work for Peace and Love and Beauty, to recall us to ourselves, to console us in moments of grief, to lift us above ourselves and point to the higher and better. The Good, the True and the Beautiful, The Universal Good. This is the mission of true art.

A PORTRAIT. Harry Stacey Benton.

WESTWARD.

J. Edward Greene.

NATURE'S FREEMAN

H. S. Redfield

# The Compass as a Time Saver in Photography.

*By I. W. Blake.*

A PHOTOGRAPH without shadows is dull and lifeless. We secure shadows by choosing the proper moment of exposure in the making of our negatives. In other words, we take note of the hour when the position of the sun in the sky is such that its rays fall at that angle which is best suited to our subject.

We know that shadows vary in intensity, size and shape, according to the time of day; that they are soft, misty and illusive, as well as long and broad, soon after dawn, because the rays from the slowly rising sun then fall horizontally. We know, too, that as the sun rises higher, hour after hour, the shadows shorten and become more sharply defined, presenting much sharper contrasts of light and shade. By noon the "lights" are intensely bright and the "shades" are black and round, for the reason that the sun's rays are falling vertically. Furthermore, we find that after midday the shadows again grow longer, until at late afternoon they stretch out in horizontal, far-reaching lines, and lie dark and sombre. Dark now, with a more general "blackness," so to speak, for night is approaching, and the light that finds its way through the trees is lessening, instead of increasing as was the case at dawn. Our subject will be at its best under some one of these conditions.

Now, suppose that we visit a certain locality in the forenoon and find several views of which we wish to make negatives. Some of these do not look attractive under the morning light, for we have learned that the artist's angle for the most effectively falling shadows is that of 45 degrees, and as this is a diagonal light we more naturally expect to find it, not when the sun stands vertical, which would be near midday, but during either the morning or afternoon. If, then, certain scenes happen to have their beauty-making characteristics on the left side of the locality, we should prefer the afternoon light, thus throwing their shadows toward the east, while those with the same essentials lying upon the right would better have that of the morning and throw their shadows toward the west. Yet there are many spots which will bear a vertical lighting, as, for example, a gorge or ravine, where the sun brightens the gloom only at noon.

Assuming that the views are to be taken under "normal" conditions and that we wish to know at what approximate hours shadows will lie at the artist's angle, how can we so plan our work with the camera as to take these different views in succession without loss of time or the need of repeated visits? By the aid of a pocket mariner's compass.

Place this compass in the sunshine, holding it absolutely level, and take care that no metallic influence is near. A nail in a fence post, for instance, should be avoided. A compass of watch size, costing perhaps 50 cents, and having a dial face marked with the more important points or rhumbs, will be the best to use.

Revolve it until the tip of the *blue* end of the needle stands directly over the star-like design or diagram printed upon the dial. The needle will then be pointing due north.

Notice that the brass cap of the needle-bar pivot casts a shadow upon the white dial. This shadow will be shorter or longer, depending upon the altitude of the sun; in other words, we shall find that the earlier or later the hours of the day (with the sun sufficiently strong to cast a shadow, of course), the longer will be the shadow cast by the needle-bar pivot. At noon the shadow is hardly perceptible.

Son. C. H. Claudy.

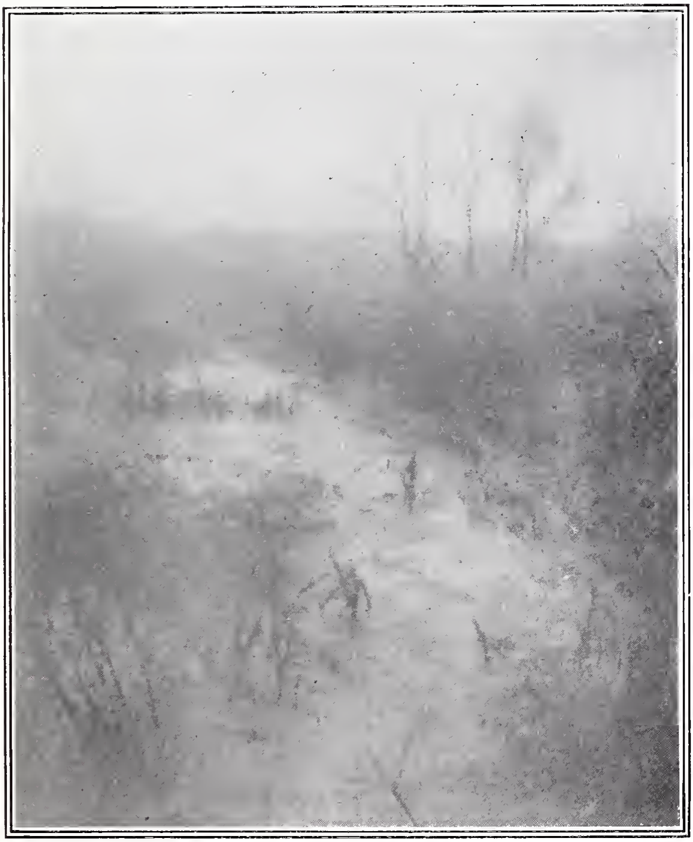
Upon the dial face, between east and south, lie the points marked east-south-east, south-east, south-south-east. Now, the time required for the sun to travel from east to south, and correspondingly from south to west, varies considerably, according to the month of the year. These degrees of variation may be found by consulting a good almanac for the hours of sunrise and sunset. Then a little experience will readily assign the intervening hours to the different points of the compass.

It being understood now that each individual position of the shadow of the brass cap of the needle-bar pivot upon the white dial face stands for some corresponding hour, it only remains to explain the remaining essentials (besides the sunshine) which must accompany this use of the compass in its adaptation to agricultural, woodland and landscape photography.

These are, first, that the *direction* of the street on which the structure stands in architectural photography must be known; and the second essential is to ascertain which *way* the building, or the selected side of any particular building, faces. After a little study the reader will find that if a building stands a certain way, or faces a certain direction, it can be taken with the 45 degree shadow-line at a certain hour only. This calculated, we can learn the best hours of the day for the making of a number of negatives by planning ahead—here a city map is often useful—and then writing a list of the subjects and their allotted hours.

In the case of woodland and landscape views, a little more difficulty will be encountered, because of the general "compass" direction of the road may not always be relied upon, on account of the curves and tangents from a given line. The best way is to walk or drive through such a road without the camera, noting the pretty spots. With the compass in hand, compare and consider carefully whether the light would fall better from the east or the west, or even from the south, and note the same in your book accordingly, as you decide for the forenoon or afternoon respectively. Then, on a suitable day, take the camera and secure all the morning views—that is, all those that require the eastern light, and pass by the views that need the western light, until the return trip in the afternoon, when they will be at their best.

Used in this way the pocket compass should be, with an intelligent application of the foregoing principles, a valuable saver of patience, time and strength.



Misty Morning. Charles Vanderwelde.

EDGE OF THE FOREST.

Robert E. Weeks.

A HALT FOR LUNCH. Wm. H. Zerbe.

# Some Recent Studies in Nude Art.

***By Dr. R. W. Shufeldt.***

Photo by Dr. Shufeldt.

FEW works of any importance, so far as I am aware, treating of the nude in photography, have appeared during the year just past. The long-promised second edition of Klary's "La Photographie du Nu" still remains an unrealized treat for us, while a few other books of the same character are to appear a little later on—perhaps by Christmas. In a somewhat different field, however, that is, in the strict study of the human figure where the illustrations are reproductions of photographs from life, there is at least one conspicuous exception, and we see it in a new edition of Dr. C. H. Stratz's "Die Schönheit des Weiblichen Körpers," a most beautiful volume, embellished with a large number of new figures and plates. This celebrated treatise first appeared in 1898, since which year no fewer than seventeen editions have come off the presses (1905), making it widely known throughout the world to all those interested in the scientific and artistic study of the human figure. In my article, entitled "Photographic Studies of the Human Figure," that appeared in The American Annual of Photography for 1905, I give a short notice of this remarkable production (p. 174) in connection with the titles of numerous other works of the kind of less importance.

In the same contribution some mention was also made of a volume I then had in preparation and which was expected shortly to appear, (F. A. Davis & Co., Philadelphia). At the present writing that work is not yet out, owing to the delay caused by my having still further widened its scope, and added not a few more illustrations to the text. It is now, however, in a fair way to see the light very soon, as its several hundred cuts and plates have all been half-toned and a linotype press is struggling with the text matter; so there is every probability it will appear some time before the article I am now writing. With the exception of the profile head, all of the illustrations here reproduced have, with the permission of my publishers (Messrs. F. A. Davis & Co.), been selected from the work referred to, which as many of the readers of The Annual are aware, has been entitled "Studies of the Human Form." Some of these, it will be observed, are studio studies, while others are distinctly of the *en plein air* order. This seems to be recognized as the natural division of such work everywhere, and it was Gleeson White who said in the first edition of Klary's "La Photographie du Nu"—"pour les futurs adeptes de la représentation du nu, il est évident que le sujet qui nous occupe doit être divisé en deux catégories bien distinctes, les photographies du nu exécutées en plein air et celles qui sont obtenues à l' intérieur," (p. 7).

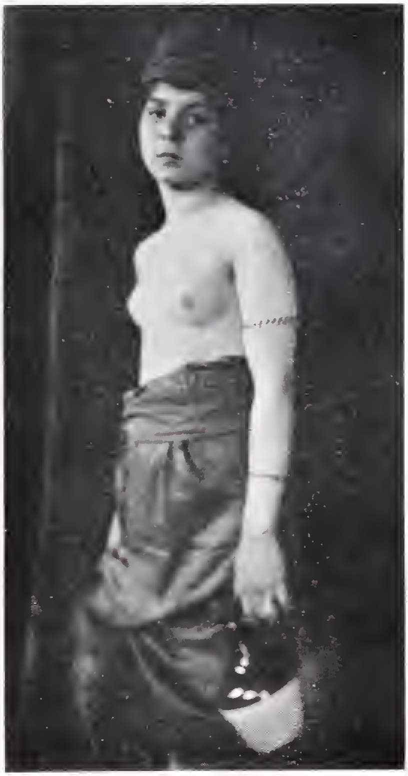


Fig. 1.—Costume Study. (Semi-draped figure.) Posed and Photographed by Dr. Shufeldt.

Within the last year my list of models for figure studies with the camera has been very much augmented; in fact, it may with great truth be said that I command an unlimited amount of material of every conceivable description and to illustrate every demand of the science. During the time specified I have made a great many new negatives of figure studies, both indoors and out, and selections from the more or less recent ones are here reproduced. There is, for example, a study in Fig. 1 of a beautiful young American girl who posed for me at my studio during the summer of 1904. She was but twelve years old then, or a month or so past that age, and was an intelligent as well as refined child, coming from excellent and well-connected parents. I obtained a few negatives of her in the "altogether," and was especially struck with the admirable proportions of her form ; her unusual development for so young a person, and the marked whiteness and beauty of her skin. She is a type with an abundance of jet black hair, fine dark eyes, and refined features. Much to my disappointment, she did not appear to take any particular interest in the vocation of an art model, for in some respects she was especially well adapted to it, and certainly was capable of rendering most valuable assistance to either artist or sculptor in the way indicated. The original of Fig. 1 is an 8 x 10 picture, and represents one of those fortunate results that we occasionally capture by a mere chance.

The first pose made with this model did not prove very satisfactory. She desired her own way in the matter a little, and upon being thwarted by me in this, although undertaken with great gentleness and circumspection, it had the effect of depriving the pose of all naturalness and ease. Subsequently this was very plain to be seen in the negative. As she turned to take her seat, however, she assumed the posture, and cast the glance at me we here have reproduced in Fig. 1, and by many this is considered to be a successful picture. This is often a very desirable thing to do, and will frequently be the means of securing you some very precious negatives. If the model is in the studio for the first time, and poses for you for the first time, she will usually be quite stiff, formal and conscious; in other words, makes the attempt—maybe not intentionally—to impress you. Under these circumstances do the best you can with the first exposure, but before you give her permission to retire turn the plate holder in the camera quickly. The chances are she will not know what has been done. Set the shutter and draw the slide, then say very gently,

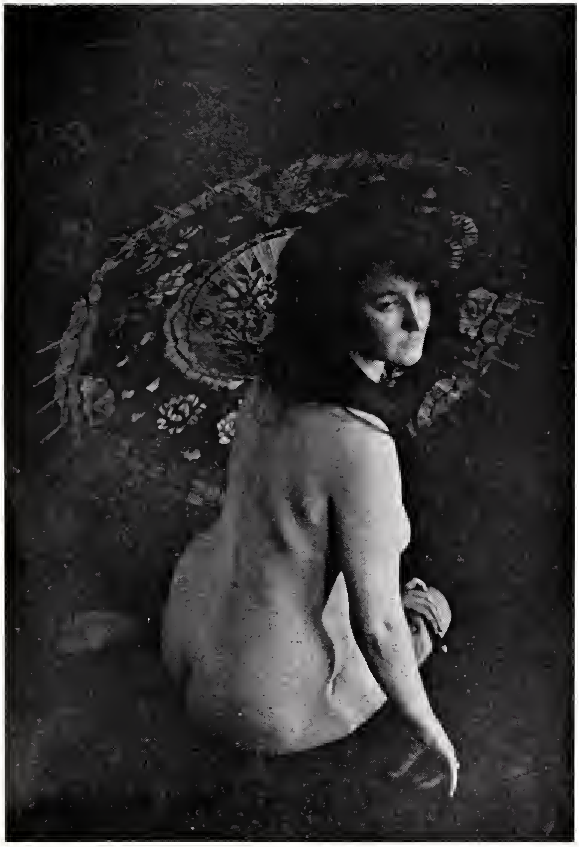


Fig. 2.—An Admirer of Japan. Photo by Dr. Shufeldt.

"That's all." At that second, ten to one, she will assume a pose away and far ahead of the first one you labored so hard to make. Make the exposure! I've gotten some of my very best results in that way.

In order to secure the very best pictures of this class possible, be they draped or undraped, indoors or out, I have always contended that the great essential thing we must see to is, that the model, apart from her beauty and faultless form, must be refined, intelligent, well-bred and *en rapport* with her art. When this chances not to be the case, it will invariably demonstrate the fact in the resulting photographs. Indeed, in some instances, the camera seems in this way to intensify, to emphasize any lack of refinement, any bad breeding, any absence of general intelligence, or disregard for her vocation that may characterize the subject. To me this has always seemed to be more evident in the case of women than it is in men, and there are very few exceptions to it in either sex, though it is less so in small children than it is in the adult.

No ordinary model could have given me the picture I here offer the reader in Fig. 2. She has one of the most perfect forms that an artist would care to see; but, apart from the arm, it would be impossible to show this in such a pose as I have here placed her in. Few could assume it so well and not appear almost deformed. She meets the requirements handsomely, and as to the real merits of her figure--well, we will have that in many poses out in my 'Studies of the Human Form" this autumn. Apart from all this, however, this model is a person of refinement, has traveled intelligently, fond of books, reading, and the use of the camera, and is now a student of Latin and some of the modern languages. She is a typical American, while properly costumed it is said that she makes an admirable Japanese lady, and, although it has never been my good fortune to have seen her so dressed, I do not doubt it for a moment.

After what I have just said it must be understood that in the use of refined and intelligent models, I refer only to those cases where the artist aims to secure pictures having an art value above any interest they may possess for the anatomist, the ethnologist or the anthropologist. With respect to the aims of the latter, it is clear that although it is well to have the picture as artistic as possible, and its entire manufacture as faultless as may be, these must not militate in any way against its value as an anthropological illustration. Here science stands before art, and the camera is encouraged to tell the truth, all the truth, and nothing but the truth. It matters not how ignorant the subject may be, how unrefined, coarse or vulgar, or illiterate to the very verge of savagery, or incapable of posing better than a stick insect, the anthropologist desires all this to be plainly seen in the picture, and that without any retouching whatever.

So, too, with the average racial types we find all over the world and in the majority of large cities. One would never dream of picking out the women from among the common class of the scores of emigrants in the lower and east sides of New York City, representing as they do the racial types of the world for his *art* models! There are thousands of them, and good photographic pictures of them are often of decided value to students in many lines of research in anthropological science, but the artist has no use whatever for the majority of them.

For several years past it has been my custom in taking a series of figure studies of a desirable model in the studio to commence the series by making one or two good portrait heads of the subject. These are frequently of value taken as illustrations in connection with the undraped studies of the same individual employed in a pictorial way in science and art publications, either in books or in magazines or other articles. These pictures I make with a portrait lens, and they usually include the torso nearly down to the waist, in some instances quite that far down.

When the case seems to warrant it an 8 x 10 camera is employed, and the head is made both where the features are taken *en face* as well as *en profile*, and the model may be draped or otherwise, depending upon the object the artist has in view in making the photograph or photographs.

All that I have said above in reference to the selection of the model, be the results for scientific purposes or solely for artistic ones, the same rules apply as those already given for the photography of the entire figure, either draped or semi-draped. In making artistic bust portraits, of course, we must summon to our aid all of the professional knowledge, all of the artistic taste, and, indeed, all of those requisites which will enable us to secure not only an excellent likeness of our subject, but a good result from every other point of view.

Along these lines my meaning will, to some extent, be made clear by referring to the subject here reproduced in Fig. 3, a young lady who posed for me during the summer of 1905. She is a well-known member of the Art Workers' Club for Women of New York City (244 West Fifty-eighth Street), and is a favorite among artists and sculptors, and is, in fact, too well known to make it necessary for me to give her name here, although I have her kind permission to do so.

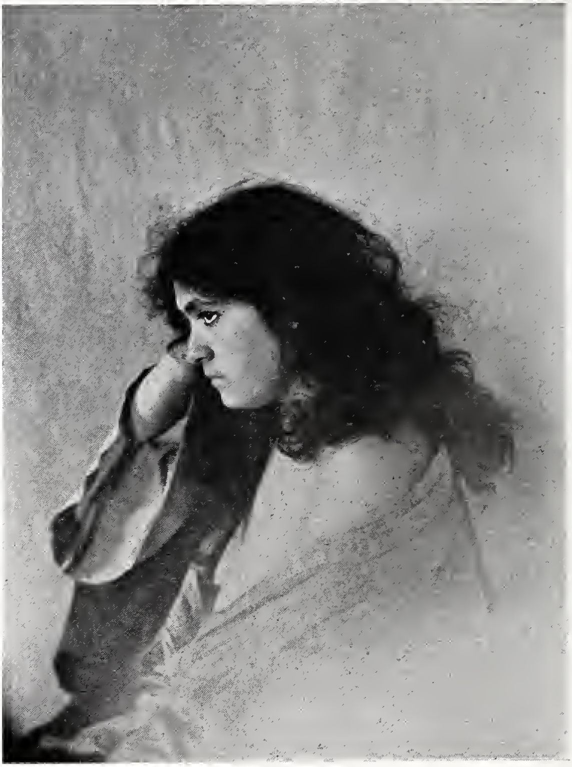


Fig. 3.—Type of the Brunette. Photo by Dr. Shufeldt.

Of the two lines of photography of the nude, that is in the studio and in the open air, I have frequently been asked which of the two I preferred to pursue, and which furnished upon the whole, the most valuable results. This is a question by no means difficult to answer, but before doing so here it may be as well to invite attention to a few points bearing upon it. Except in extremely rare instances, and barring tropical and subtropical climates, we are only permitted to make photographic studies of the nude figure out in the open air, especially in the case of women, during those months of the year when it is warm enough to allow of the model's removing his or her entire clothing for a greater or less time under such conditions. On the other hand, in a properly lighted and large airy studio such photographs can be made at all seasons of the year, though, as a rule, they can, with greater comfort to the artist and model, be made out-doors in the summer time.

In the studio the matter of backgrounds and accessories is a matter of ceaseless concern, not to say annoyance, and especially is this the case if we make a large number of pictures of nude studies. Under these circumstances, the monotony of the background and the demand for new surroundings becomes at times almost maddening.

Out of doors, the matter of obtaining backgrounds is practically without limit, and this part of the problem resolves itself into the question of suitable and artistic selection of the places for posing. Thus it becomes a matter of pleasure rather than one of professional solicitude, as is often the case in the studio. But, again, in the latter, the artist is more at ease and commands a greater amount of leisure to properly pose his model than he does out-doors. This, however, sometimes has its advantages with subjects whom he has met for the first time, for it presents opportunity for better acquaintance; the time to instruct the model; to interest him or her in the work you have before you, and to exhibit what you and others have accomplished along the lines wherein you are now engaged. There is nothing to be lost by all this and a great deal to be gained. Out of doors, on the other hand, it altogether too frequently happens that the pose is hurried through with for fear of surprise from persons approaching the spot while you are busily engaged with your work. This throws an unnecessary responsibility

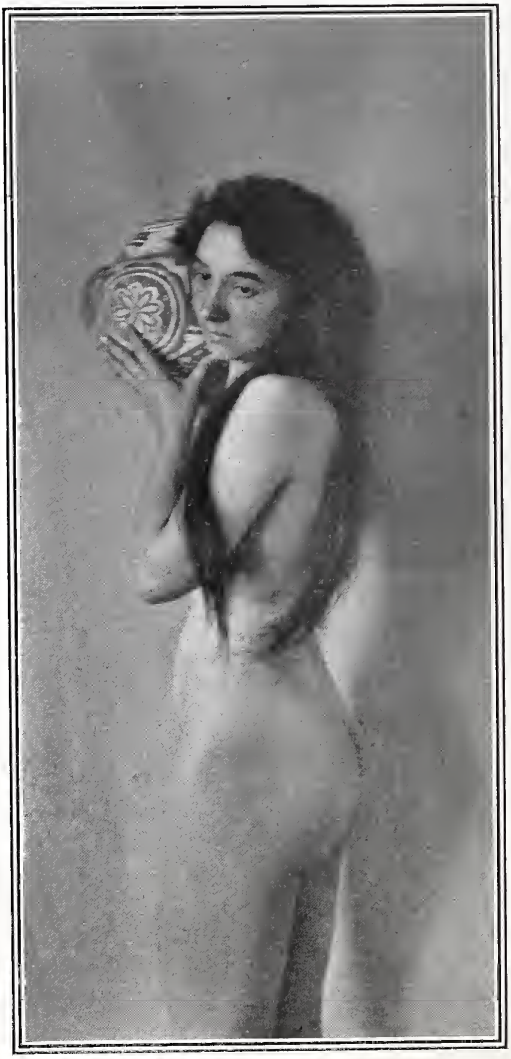


Fig. 4.—SIWILUHSITSA. Photo by Dr. Shufeldt.

INCOMING TIDE

**W. H. Porterfield**

upon the artist's shoulders that never can in any way prove to be a helpful one, while often it embarrasses the model, or induces in her a timid state of mind that may sometimes prove detrimental to the success of the object to be attained.

There are but two ways to avoid all this, and one is to make absolutely sure of the safety and seclusion of the spot you have selected, and the other to obtain permission from a rural estate owner, with extensive grounds, to do your work there, and where other trespassing on the part of any one is strictly prohibited.

Finally, we come to consider the relative value of photographic studies of the nude taken in the studio (interiors) and those obtained in its widest sense, *en plein air*. Everything being equal, I am personally of the opinion that in their way one class can be made quite as valuable as the other, and, as to the taking of them, it entirely depends upon circumstances. Some of my experiences in this field out of doors have been of such a disagreeable nature that I fail to find language adequate to describe them, while again others have been so filled with pleasure and enjoyment that the very thought of them is sufficient to wipe from the tablets of my memory all recollection of these expeditions which did not turn out so pleasantly. So the history and record is squared up, and what I have just said applies with quite as much truth to my experiences in this line, indoors or in the studio.

Apart from this, so far as any first-class photograph of the nude is concerned, made under either of the two conditions specified, it may be of just as much value to the morphologist, to the general anthropologist, or to the artist and lover of art, as the case may be, whether it has been made under one or the other.

It is clear that if we are called upon to make an anterior, posterior, and lateral views of a nude subject for the anthropologist, we can make the exposure and get just as good a negative indoors as we can out, *provided* we in each instance perform the operation in the proper light and select proper backgrounds. The same holds good when we come to make such pictures for anatomical purposes. As to true art pictures of the nude obtained with the use of camera purely

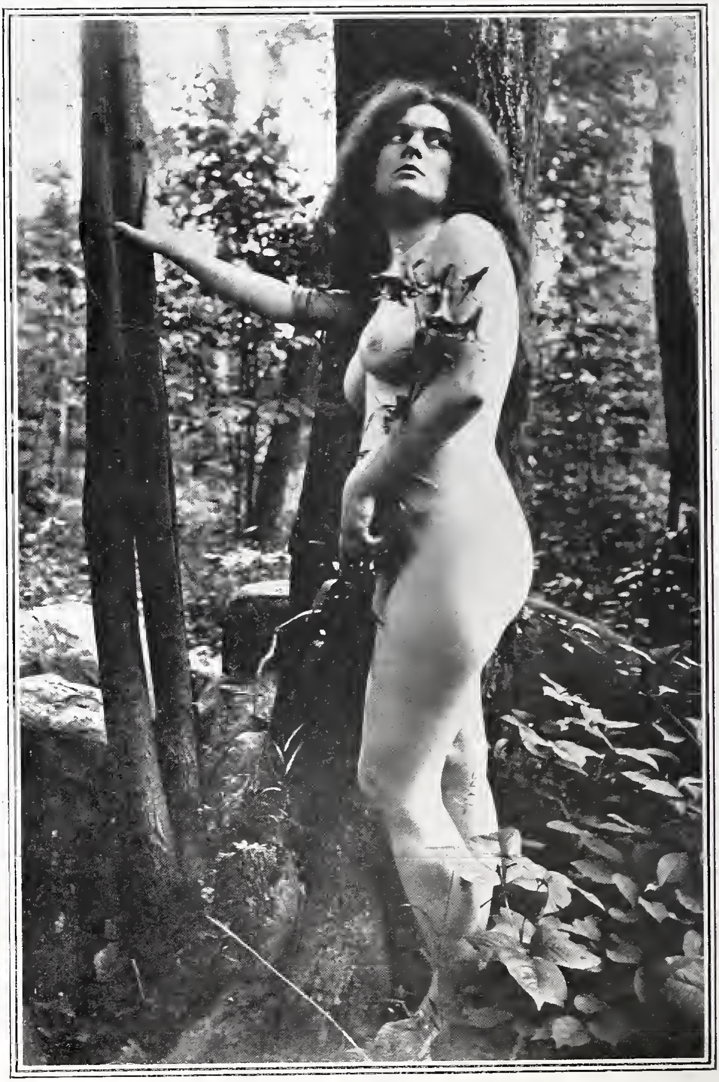


Fig. 5.—Down Where the Canadian Lilies Grow.

Photo by Dr. Shufeldt.

for their own intrinsic beauty, and quite apart from any utility they may possess beyond this end, I am free to confess I am rather partial to those made in the forest, at the seashore, down in the meadows, or along the banks of streams and rivers. Such results as I here present in Figs. 5 and 6 are of the kind that appeal to me, and, from what I

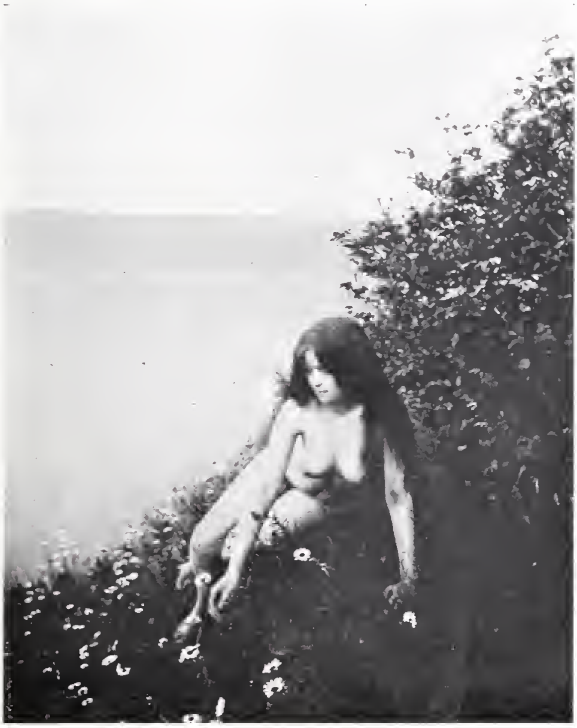


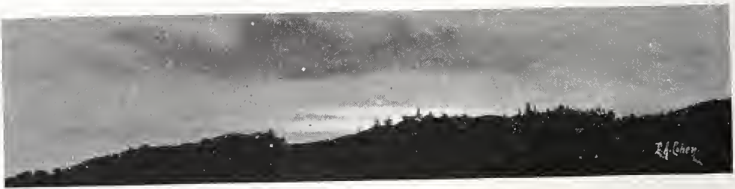
Fig. 6.—Where We Find Daisies on Hudson's Palisades.
Photo by Dr. Shufeldt.

have heard said about them, I am sure they do to others. Their being the more difficult to secure also lends to them a peculiar charm not often possessed by those obtained in interiors. It has been my fortune to have taken within recent years quite a number of this character, and the best of these have been used as illustrations in my "Studies," where the reader will find them if the book chances to be published by the time that the present article appears.

The girl that posed for the subject here reproduced in Fig. 5 is a pretty little Swiss type from Neufchâtel, but I have taken much prettier pictures of her than this, but they would hardly find a place in the contribution I am now writing. It represents a studio result as contrasted with those taken out-doors.

Of all the pictures of this kind that I have secured through my own personal work, there are none of them that I like better than the class I please to call "marines." These appeal to me entirely through their art values, the surroundings, and the condictions under which they were obtained. I love the seashore, shells, seaweed and the surf, and I love the solitude that all these must have if one comes to use his camera there, and expects to include in the pictures that most divine of all nature's beautiful forms —the form of woman.

My models have been my friends to me in all this, and have at different times generously gratified the fascination it has for me, so that now I have them on the great long stretch of shore where the Atlantic is quiet and still; I have them in the boisterous and bursting surf, and I have them where the latter is rolling majestically in at their feet. All of these now have their histories, histories of long and hard triumphs ; of thirst, and shoes filled with sand ; of myriads of vicious mosquitoes, and, indeed, of a score of other experiences too numerous to make record of here, but none the less pleasant to enact over again in one's mind as time rolls on.



FARALLONES IN A SUNBURST. Edgar A. Cohen.

WAITING.

W. S. Cline.

THE BARN. F. C. BAKER.

# A Plea for Naturalness.

### *By Mrs. W. W. Pearce.*

OFTENTIMES a mother will say to me: "Oh, Mrs. Pearce, I do so wish you would take Mary's picture, now I have the most beautiful pink dress for her."

While I cannot say: "Oh, cut that out," I do say, "never mind that beautiful pink dress, send her along with the other children just as she is, only see that her face is reasonably clean."

Well, I *might as well have said*, "*Oh, cut that out*," from the icy stare I received, and the opinion of myself in that good mother's mind, *i. e.*, that Mrs. Pearce must be really crazy to prefer to take Mary in her old duds.

And yet I never took a prize of Mary in her dress she wears to Sunday school; but my little every-day boys and girls in their sweaters, ginghams and overalls, have meant good money to me.

Now apply this rule to the baby. How much more important.

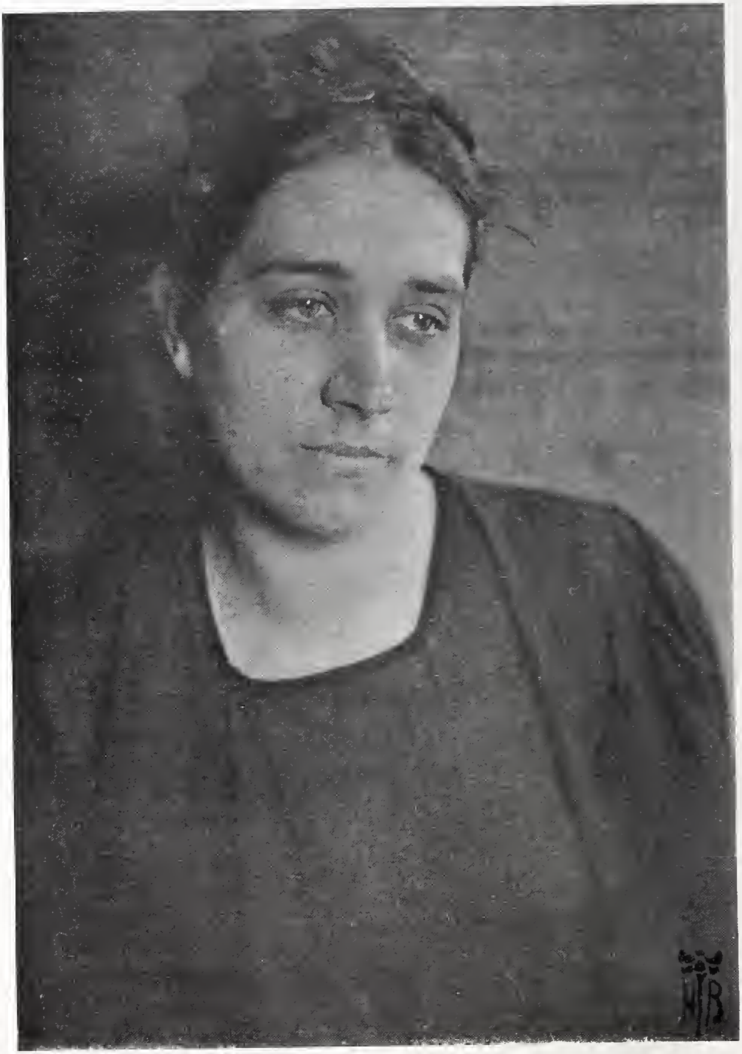
Do we ever see the blessed infant in real life perched up in a dangerously precarious position on a white fur rug (tied invisibly, of course, though it be) with its embroidered skirt *stretched out* to show every bit of the beautiful detail?

Never! A baby under six or eight months old is most always being held by some one, consequently our "Mother and Child" views in the studio will always be right.

But I favor most the simple at-home pictures in the home room, of mother holding her baby surrounded by all her little personal belongings, or if baby *must* be alone propped up by pillows on her own little bed.

Mrs. W. W. Pearce.

CONFIDENCES. Mrs. W. W. Pearce.



PORTRAIT. HARRY STACEY BENTON.

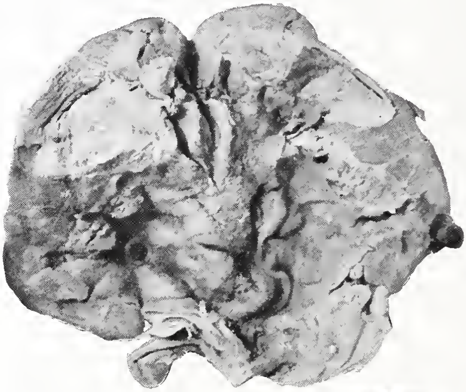
# Immersion Photography.

### By Malcolm Dean Miller, M.D.

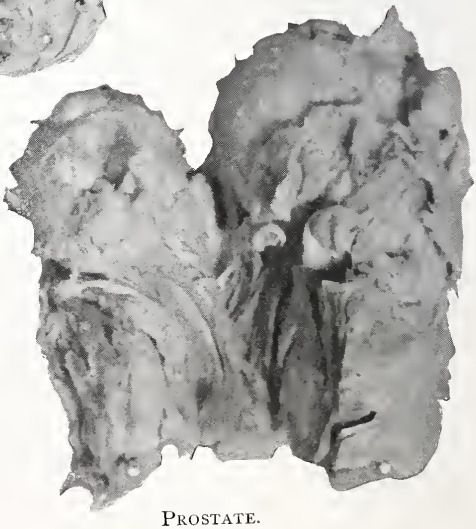
IT sometimes happens that professional or even amateur photographers are called on to make pictures of objects which baffle their best skill by reason of their reflections. In all cases in which wetting the specimen will not injure it, especially if it is of small size, the problem is most easily solved by photographing it under water. This is particularly useful when the object is an organ which has been preserved in alcohol, formalin, or other fluid, and some physician wishes a clear, detailed, full-size photograph for illustrating a report of the case. The only extra apparatus required is a suitable jar or vessel for immersing the specimen, reflectors, and some provision for pointing the camera directly downwards, such as a tilting tripod top, many excellent forms of which are now on the market. Failing the last, just strap your regular tripod to the table and go ahead. A large cylindrical glass jar is the best receptacle, and it is well to have a board cut to fit the bottom, either covered with white and black velvet on the two sides or painted.

Arrange the specimen on the board, pinning it down as necessary, and sink the whole with weights so that it is completely immersed in clear water. Place the jar on the floor where it will get the full light from a window, and break up the shadows by arranging the white cardboard reflectors until the lighting is very soft. To aid in getting a sharp focus, it is advisable to drop some clearly stamped flat metallic object on the specimen. Use a double-coated plate and time fully. Develop for softness and gradation. If the first exposure is not correct, make another, remembering that in this sort of work the exposure must be adjusted to the developer. A good standard is five minutes in a grain and one-half pyro. The negative must print every bit of detail in high-lights and half-tones.

The accompanying illustrations are of a prostate removed twenty-eight days before death and of the right kidney from the same subject. The latter shows the extensive pathological changes in the pelvis of the kidney as well as a large single cyst, the rupture of a vessel in which caused the fatal result. Changes in the pyramids and cortex are also well brought out.



Kidney.



Prostate.

PORTRAIT. HANA ROBINSON.

# A Simple Print Washer.

*By C. M. Whitney.*

THE proper washing of prints, for amateurs who do much work, in somewhat of a task.

If conscientiously done, as it should be, it involves the expenditures of a good deal of time, as well as much tedious work.

To lighten the worker's labors in this direction numerous clever devices have been put on the market, some of which are very satisfactory in operation.

There is a large class of amateurs, however, who derive as much pleasure from the construction of some bit of apparatus as from the actual work of picture making, and for the benefit of these enthusiasts, I give here a description of my own home-made washer, which, after a good deal of use, has proven very satisfactory.

A round, galvanized iron pan forms the washer proper. This is one of the pans used to catch the drip from a refrigerator, and the extra large one which I have is about sixteen inches in diameter and five inches deep. It has a handle on each side and is made of heavy material.

On the side, about a half inch above the bottom, I punched a quarter inch hole, carefully smoothing off all roughness with a file, so that there would be no projecting points to catch and tear the prints. On the outside of the pan, over the whole was soldered a piece of quarter inch brass tube about an inch and one half long. The end of this tube was filed off on a long bevel, so that when in place it lay along the side of the pan instead of projecting radially.

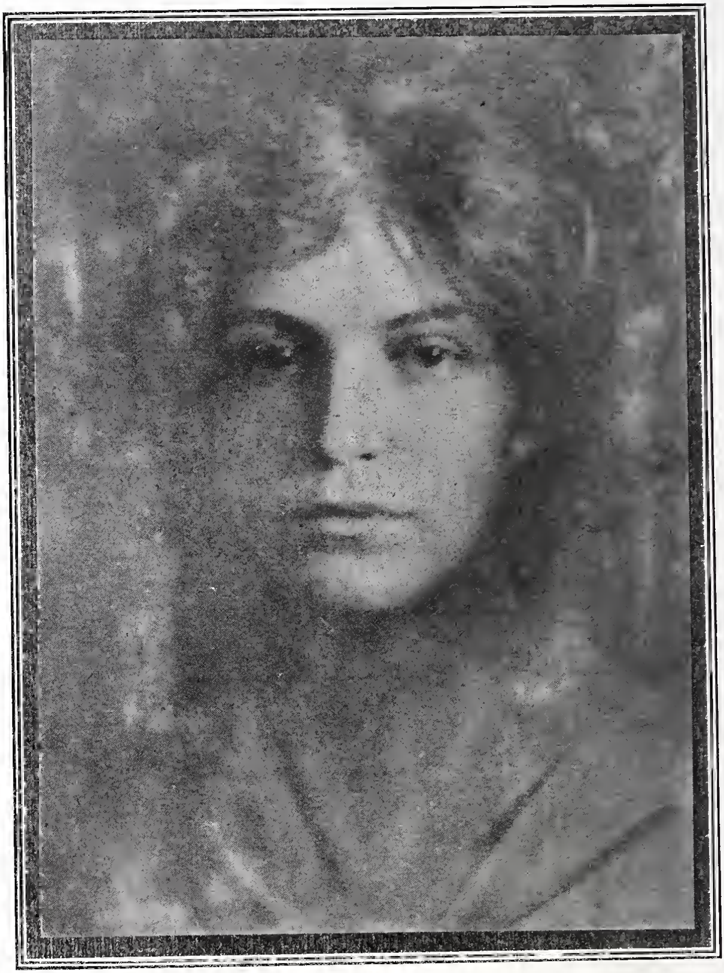
A piece of quarter inch rubber tube about three feet long was slipped on the projecting end of this tube, and made fast with a few turns of fine brass wire. Another piece of the brass tubing, about three inches long was slipped into the free end of the rubber tube, and also wired in place.

A pine plug, whittled to fit tightly into the bath tub faucet, was bored lengthwise to take the free end of the three inch length of brass tube, the fit being a tight one, to ensure the tube staying in place. Two coats of asphalt varnish completed the washer.

It is apparent that the water will enter the pan in such a manner as to take up a circular motion, sweeping round and round, and keeping the prints in motion, so that the hypo is effectively removed with very little hand work, except an occasional handling over. A few small holes punched as near the bottom of the side as possible, will allow the hypo to escape, as it naturally sinks to the bottom.

This simple device, if kept well coated with asphalt varnish, should last a lifetime, and cannot but prove of use to any careful worker, who has a proper regard for the permanence of his work.

THE LAKE. John Dohlman



KALOMA. J. EDWARD GREENE.

# Copying.

### By Frederic G. P. Benson, York, England.

COPYING to the average amateur does not convey much more than the reproduction of some old portrait, in most cases much delapidated.

In its fullest sense copying, however, means much more, and anyone who will by a little careful work make himself master of its special difficulties, will find he has obtained a very valuable accomplishment, and one which will render a great portion of his work much more easily done and more satisfactory in its results.

In the first place, it gives the power to correct any little defect there may be in the original print, for example, if the negative has been overxposed and gives a flat muddy print, then by making a fresh negative and giving a short exposure and developing with a solution strong in pyro, it is possible to obtain quite a bright crisp result.

On the other hand, if the print shows too much contrast, by giving a full exposure and developing with a weak developer, the original defects can be considerably modified.

Faults of the above nature, can be frequently remedied much more effectively by making a fresh negative, than by resorting to intensification or reduction, with the additional advantage that the original negative is not affected in any way.

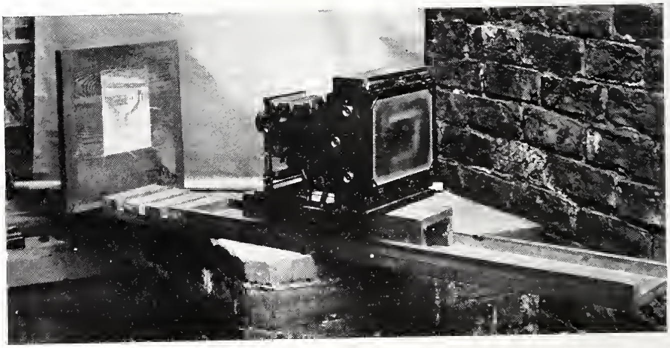
Again, how often does it occur that no matter what size plate may be used, the really effective pictorial portion of a print only occupies but a small portion of the whole.

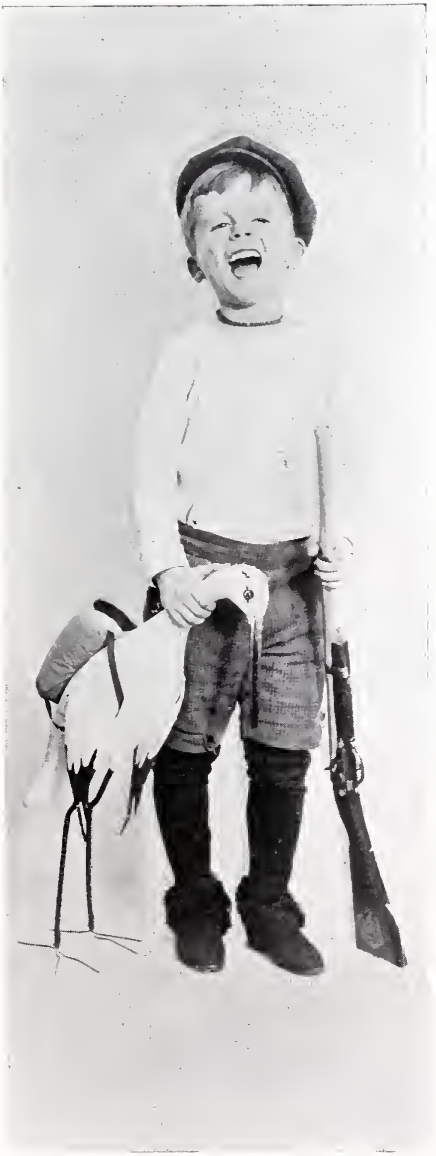
Copying again comes to our aid, and having made a print and trimmed it to the desired proportion, it is quiet easy to make another negative, enlarging to the full size of the camera one may be using.

The chief benefit which is derived by a course of copying work, is in the intimate knowledge obtained of the capabilities of the developer, and the close connection existing between exposure and the use of a suitably compounded solution.

The ability to produce any desired class of negative at will, thin, dense, brilliant or soft is a very valuable accomplishment, and not only gives the worker more confidence, but renders his work more generally useful; copying, almost more than any other course of work, will give this desirable accomplishment in the shortest possible space of time.

Although no special apparatus is really necessary for the successful undertaking of this branch of work beyond a camera which will extend to nearly three times the focal length of the lens, still a simple board arrangement as shown in the photograph herewith, enables the work to be done more easily and with absolute certainty of obtaining perfectly rectangular results—one of the features which presents some little difficulty when a tripod is used to support the camera.





HUNTING IN TOYLAND.

WM. H. SCHAEFER.

# Photography With a Reflecting Mirror Camera.

By J. Tedi.

IT is not so many years ago that when we desired a picture of ourselves taken by a photographer, we thought twice before undergoing the ordeal; it was a slow, tedious process. That was in the days when wet plates and stand camera were considered the acme of perfection, but I am thankful to say that photography has kept pace with the times.

Our pictures are taken now—and often we don't even know until we see ourselves in print—and often wonder where the paper or magazine procured the photograph for reproduction. We look over the magazines of to-day; we see wild beasts in their native haunts; birds feeding their young in the nest; we see fire engines going at full tilt on a call; horses on the race track full of life and action, every muscle showing the strain both in driver and beast; then again we find children at play, perhaps crying—no matter what, the camera has caught them just at the right moment. Their expressions tell the story.

This was not possible a few years ago before the Graflex Camera, focal-plane shutter, and more scientific plates were known. Perhaps we want a photograph of our mother, father or friend; we make many exposures, but there is something wrong—the eyes stare, the back too stiff—and nine cases out of ten too much dressed up; it doesn't look natural. This all comes when we pose. Let me say here the most beautiful portraits ever taken were snap-shots, those while mother was in the garden, with a wrapper on, perhaps picking flowers, or our children at play.

There are still other subjects we desire and those which require speed on the part of the camera, and a sharp eye

TAKING SOUNDINGS

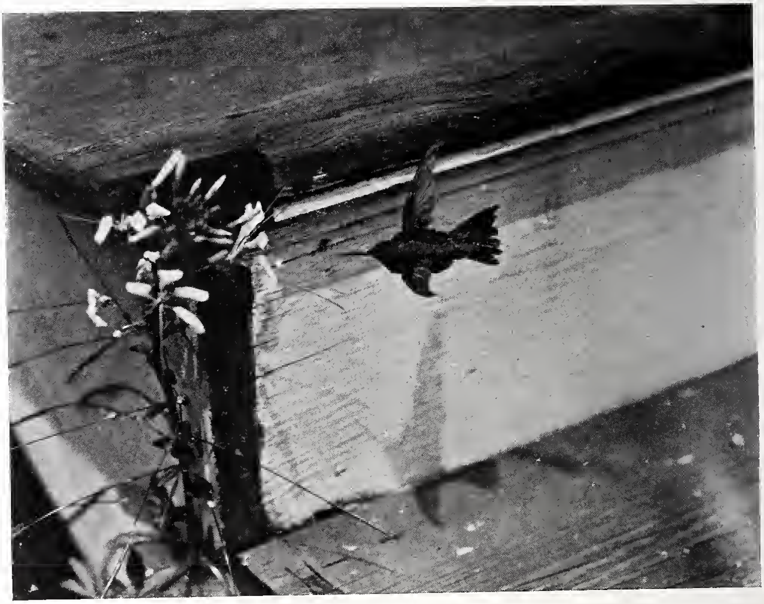
Rev. E. G. Watts.

on the part of the operator, and that is what I have already mentioned, such as wild animals in their native haunts, or rapid moving subjects, one of which is here reproduced. But all this is only possible with a camera such as a Graflex, where the operator can watch his subject and at the proper instant press the button and procure the desired picture.

It may be well to say here, for the benefit of those who are not as expert with the Graflex as they desire, that, like everything else, it requires long practice before success can be reached ; but when the photographer once procures a negative which gives the desired result, he is possessed with a craving almost as bad as drink, or, in other words, he immediately becomes a "camera fiend."

SWEETHEARTS.

If you have ever had stage fright, the feeling is just about the same as when you try your first Graflex picture of anything moving at a rapid rate of speed. You focus and keep on focussing, trying to get the image larger; then at the same time you see the background is not suitable, so you wait still longer, and in another instant the subject more than covers our plate and has passed. Then we content ourselves with trying to take a rear view, and in our hurry to get something before it is gone entirely, as I did, we forget we have not pulled out the slide which covers the plate; but I pressed the button and thanked myself that I had saved a plate. Many exposures were made with very poor results. So I concluded my first exposure was by far the best from one point, and that was by continuing the same method of training the eye to the subject (without pulling the slide) and continue this for some time, not trying to expose a plate, but merely pressing the button, when my objects which I wished to photograph were well in focus, correct size, etc.



Humming Bird in Full Flight.

This will be found a very great help to beginners, and, by continuing along these lines, it is safe to say more pleasing results will be accomplished; of course, familiarize yourself thoroughly with all the adjustments first, practice getting the camera ready, and then practice the focussing of the moving objects.

JANUARY THAW. ADOLPH PETZOLD.

# Night Photography at the St. Louis Exposition.

*By Percival E. Fansler.*

T was not until the summer of the St. Louis Exposition that I became aware of the fascination of night photography, but after six months work in that interesting field, I became an enthusiast. During the winter I had examined a magnificent collection of lantern slides picturing the illuminations at previous expositions, and I immediately became fired with the idea of securing a series of pictures of the St. Louis Exposition at night.

I had never before attempted anything of the kind, and consequently had no conception of the proper exposure of the negative, or of the best way to develop, so I sought out my photographic friends, only to find that they were no better informed.

Needless to say, I used a non-halation plate, and I soon found that a Seed non-halation was superior to any of the home backed plates, with the absence of the "messing" inherent in the latter. Development was the first stumbling block, but a chat with the Seed headquarters soon cleared up the trouble, and thereafter no failures were charged to this account. Following the advice given, I used a weak developer, watching the plates until the first appearance of the high-lights, then covering and continuing development for a total period eight times as long as it took to bring up the high-lights. This adaptation of the "tank" method resulted in uniformly brilliant negatives.

While the preliminary lighting tests were being made, I carried out a series of experiments designed to determine the exposure rule. It must be remembered that photographing sources of light is entirely different from daylight work. A picture of a building taken by the light of the sun requires the same exposure at a distance of 200 feet as it does at half of that distance; but at night, supposing the same building to be outlined with incandescent lamps, an exposure from 200 feet will require four times that required when the camera is 100 feet distant. This is due to the fact that the intensity of light varies inversedly as the square of the distance from its source.

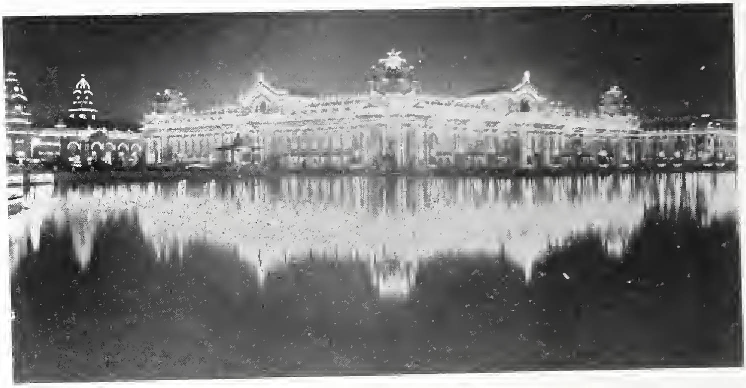
1. View Down Grand Plaza.

2. Festival Hall and Colonnade of States.

3. Festival Hall and Main Cascade.

Of course, this rule did not hold good under the conditions met with at St. Louis, the reflected light from adjacent buildings, the general luminosity of the area, the atmospheric conditions, and several other factors changing the simple law into a complicated one. The Palace of Electricity, the most brilliantly illuminated building on the grounds, naturally required a much shorter exposure than the Transportation Building, but the many other factors made it more a matter of judgment than anything else.

For views in and about the "main group," as the buildings on the lagoons were called, I stopped to *f*/32, and exposed from fifteen to thirty-five minutes. The pictures of Festival Hall and the East Cascade, Figs. 3 and 2, are my "pets." They, with five others, were made on the last night of the Exposition, and are excellent examples of the details that can be secured at *f*/32 and thirty-five minutes exposure. To get the Festival Hall negative, I was obliged to crawl out among the dolphins and swing the camera far out above the rushing water, that reminded one of a mill-race. The vibrations were so pronounced that, at the time, I hardly expected much of a result. The bird's-eye view of the Exposition was taken from the eighth floor of a building a mile away, and was the only one ever taken



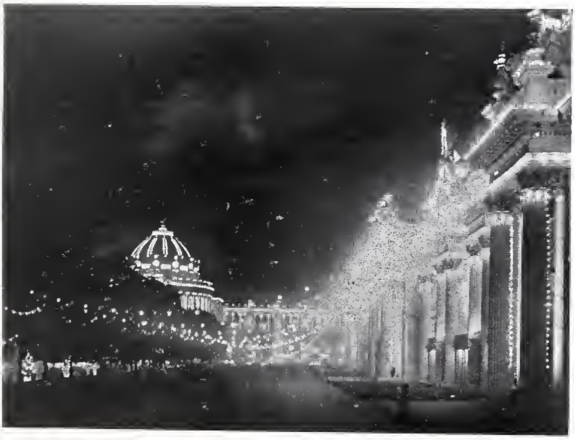
4. Palace of Electricity.

It will be remembered that a three-colored scheme was carried out in the illumination of Festival Hall, the Colonade, and the flanking Pavilions. Three distinct electrical

AGAINST THE STREAM

Adolph Petzold

circuits were provided, one each for the yellow, emerald-green and red lights. Each color was lighted for fifteen minutes at a time, slowly dying out, to be supplanted by another color, as slowly "brought up." One would suppose that little or no impression would result from an exposure while the red lights were burning, yet I have it from one of the foremost photographers of the country that three numbered negatives, equally exposed on the different colors, could not be told apart after development. At the same time, reference to Fig. 5, which shows the facade of the Palace of Electricity, will disclose the fact that alternate lights in the festoons (and they were red lamps) did not make much of an impression on the plate. The green, however, was almost as actinic as the yellow.



5. East Facade. Palace of Eletricity and Festival Hall

As no restriction was placed upon the use of small hand-cameras, they were everywhere to be seen, and millions of exposures were made, many of them being at night. Not one operator in a hundred had any idea of the proper exposure, and I saw not a few snap-shots taken, where, with the lens used, ten minutes at full opening would not have been excessive. As tripods were not allowed, every imaginable subterfuge was resorted to—in some instances the operator held his camera against his body for ten minutes, and upon development probably wondered why the result was a la

Stieglitz. Literally hundreds had no horror of distortion, for in daylight, as well as at night, it was no frequent thing to see a box tipped at an angle of fifteen degrees in an attempt to cover Festival Hall from a nearby point. Many pictures including the lagoons were taken with no thought of the havoc created by the lights on the electric launches that swept by—the easiest way out of that difficulty was to wait until a scurry of rain sent the boats flying into shelter under the bridges, or until an hour when business was so dull that only two or three were running. About the only difficulty I experienced was when a too inquisitive country bumkkin, in his endeavors to see what was going on inside of the box, "via lens," would disarrange the setting of the camera or tripod, in which case it was a case of "try again."

6. Festival Hall. Main Cascade and one of the Fountains.

I might add that I used two Goerz lenses, one a Series III of 9½-inch focus, the other a 6-inch of the same series.

7. Bird's-eye View of St. Louis Exposition by Night.

A FAVORITE OCCUPATION. Rev. E. G. Watts.

# First American Photographic Salon.

By Curtis Bell.

UNDOUBTEDLY the most important event of the past year was the First American Photographic Salon. In magnitude nothing of the kind has ever even approached it, and its artistic importance is generally conceded by the highest authorities in all sections of the United States. It is likely that never in the world has there been a photographic exhibition containing so many masterpieces, nor of so high a general average. Every phase of art, from the delicacy of poetic sentiment through the realism of academic manner to the richness and mystery of the tonal school was here represented in its very highest expression.

Between 75,000 and 100,000 people attended the Salon in New York, Washington, Pittsburg, Chicago, San Francisco, Portland, Oregon, Boston and Philadelphia, and there can be no question that a very great number were for the first time interested in photography by this comprehensive and attractive exhibition of the world's best works.

The American Salon was organized, *not* for the purpose of providing a representation of modish and clever work for the enjoyment of a select few, *but* to advance the real interests of photography by a selection of the gems of all the photographic "schools" of permanent, enduring work, chosen by the highest authority in judgment of *art*, and *shown to all who could be induced to take an interest therein.*

STUDY IN BLACK AND WHITE. J. EDWARD GREENE.

# The Passaic and Its Falls.

*By Charles Leonard-Stuart.—Illustrated from Photographs by the Author.*

"When in New York don't fail to visit the Passaic Falls at Paterson, New Jersey;" then in a convincing tone, "Really, second only to Niagara in the East." This comment was overheard last year while at the depot at Niagara Falls City, N, Y., awaiting an eastbound express, after a three days' sight-seeing sojourn around that famous cataract and vicinity.

The Passaic item, however, could not be substantiated by any personal knowledge on the part of the New York listener. A sluggish, muddy stream winding through swamps between Jersey City and Newark, visualized itself on the mind, with the redeeming feature of a reminiscent glimpse near Arlington of a picturesque stretch, blotted again by the memory of an uninteresting path-bounded reach seen from the train when passing through Paterson.

Later inquiries among a large circle of metropolitan acquaintances failed to corroborate the overheard eulogy; in fact, the ignorance or indifference in regard to the scenic wonder was marked; including a New York-Patersonian with large milling interests, not a single friend questioned had ever seen it, some even had not heard of it; one acquaintance volunteered the pessimistic information that a friend of his knew a man who said the falls was "a mere dribble over a ledge of rock into a rift."

Photographic views were then sought and found wanting until a reference to The American Annual of Photography for 1899, p. 27, revealed Vernon Royle's artistic "top" picture. Encyclopedic research was more fruitful, yielding some ancient information, which condensed, informs the reader that the Passaic River rises in Mendham, Morris County, N. J., north of Basking Ridge, and after a circuitous course of 90 miles, south by north, northwest, and again southward, during which it forms part of the natural boundaries of various counties, finds an outlet in Newark Bay. The river is noted for the scenic beauties along its course, and at Paterson, the "Lyons of America," so called from the number of its silk mills, descends in a cataract having a fall of 75 feet, and a perpendicular leap of 50 feet, affording immense power which is utilized by means of dams connected with races that run through the manufacturing district, and supply the mills along its course.

Furthermore, it added, raising the smile ironical in view of the knowledge-seeking experiences above related, "as one of the natural wonders of the State, the cataract is largely visited by tourists." Other interesting information connected with the river was, that with its affluents above Paterson—the Ramapo, Wanaque, and the Pequannock with the Ringwood, uniting to form the Pompton River, and the Rockaway with its tributary, the Whippany—all drain the beautiful Orange and Ramapo Mountains, and yield at a minimum of 200 feet above the sea 314,400,000 gallons of water daily, available for the supply of northern New Jersey cities.

No. 1.

More modern data was connected with the sewage pollution which from Paterson downward has destroyed the historically famous angling, boating, and bathing facilities of the Passaic, and marred the attractiveness of its picturesque banks as sites for country residences, the long line of handsome but deserted dwellings on its shores bearing silent and reproachful evidence thereto. The purification scheme which for years has agitated the cities along its course seems "simply" destined however to send the evil farther afield to the detriment of Newark and New York Bays, when it would have been so easy to have taken advantage of the experience to be gained from the scientific systems of sewage disposal on a financial accruing basis adopted by Berlin, Paris, London and other large European cities. Still, municipal economic blundering bears but a discursive though knowledge-acquiring relation to a photographic pleasure jaunt; let us then "return to our mutton," as the schoolboy translated the famous French dictum.

No. 2.

From the water supply statistics above quoted, coupled with the casual and unsolicited Niagara testimonial, it was inferred that a large volume of water—something more than a dribble—should be pouring over the falls at Paterson, and that while a source of pleasure to bygone generations of tourists, the cataract now was evidently much neglected by the average sight-seeker.

Resolving to be no longer in the category of the "metropolitan untraveled" in regard to the New Jersey wonder, one fine Saturday afternoon, leaving Harlem, Manhattan, a landing was made on the Jersey coast at the Fort Lee ferry station. Wishing to view the country leisurely, there a universal automobile — otherwise a trolley car — was boarded. It was a delightful journey climbing up the Palisades through the tastefully laid out park, descending into the vast meadow lands beyond, traversing picturesque Hackensack, and catching a glimpse *en passant* of artistic Arcola, which occasioned a special journey two weeks later for pictures of that neighborhood. Four nickel fares at length brought us to our destination, the city named after Gov. William Paterson, when settled in 1791, under the patronage of the versatile and ill-starred Alexander Hamilton, by a $1,000,000 cotton manufacturing company, formed to utilize the power afforded by the falls. Notwithstanding its notoriety in recent years from "visitations" by water, wind, fire and crime, the latter including anarchical fame

No. 3.

and mayoralty embezzlement, the impression occasioned by this, a first "stop-off" visit was favorable. The public and commercial buildings which have risen from the ruins left by cyclone and fire, the handsome stores, trolley-lined and asphalted avenues and streets, would grace any metropolis.

Following instructions, near the City Hall, seats were taken in a Totawa car, and a descent made at Maple Street. Here the surroundings were sordid and depressing. Frame dwelling houses of a mean order, and in want of fresh paint, line a badly built down grade street, leading to a small ill-kept park surrounding the falls.

No. 4.

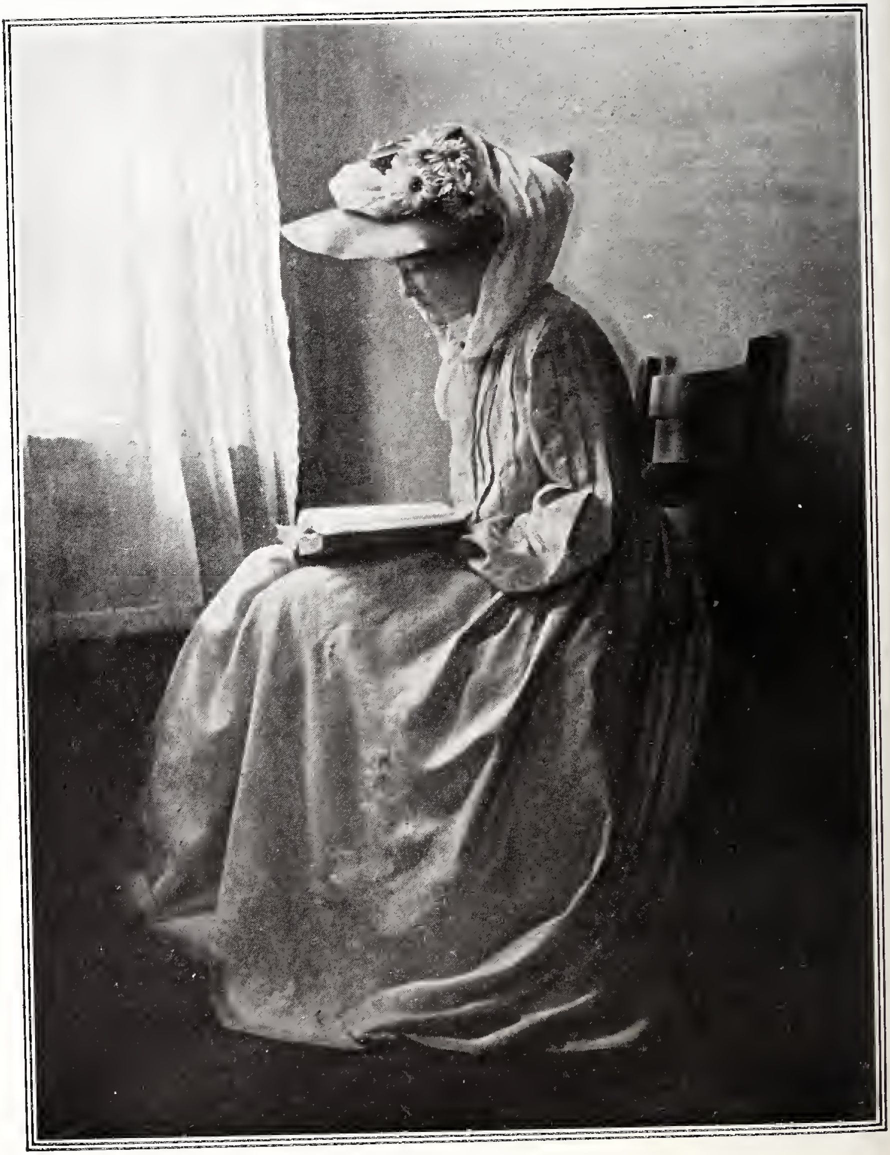
But the cataract! Was that disappointing?!!!!! Judge from the exclamation points, while the camera products exhibit beauties which rise superior to verbal description, and conjure visions of what the locality must have looked like in its primitive and Amerind haunted condition. See picture No. 1. Here was no "mere dribble," but the accumulated hill waters with a magnificent sweep bending under a distant bridge, flowing over an imposing dam (picture 5), and hastening in bubbling rapids, and smooth, treacherous looking, glassy side shoots to a superb and turbulently boiling leap over an irregular, serrated ridge of green-stone trap rock. Thence they plunged down a fifty feet dip into a narrow, transversal chasm or ravine, rifted diagonally across the bed of the river, the miniature abyss seething with the pouring, roaring, breaking waters, which dashed aloft clouds of spray and mist tinted by the inevitable rainbow and almost equalling the phenomena of the American Falls at Niagara. Raising an umbrella, a break was made through the mist for the picturesque bridge spanning the ravine where picture No. 2 was snapped. The natural beauties all around were so superior to anything that had been anticipated, that the many traces of mankind's mean presence were overlooked. Skirting the precipitous edge of the vast, circular pool into which the waters flow sideways from the ravine—as if to rest for a few moments after their mad plunge before resuming a wild and rapid course onward to the city—an advantageous position was sought above the bathing place built in the pool, and here picture No. 3 was taken. It shows the pool, bridge, ravine and falls. That bridge evoked reminiscences (encyclopedic) of Sam Patch who early in last century made a reputation for diving feats by leaping from the bridge spanning the Passaic Falls a distance of 80 or 90 feet. He afterwards made a leap of more than half the height of the falls at Niagara, but lost his life at twenty-two years of age when diving 125 feet at

No 5.

the Genesee Falls, Rochester, N. Y., in 1829. An employe of the bathing house informed us that many of the mill lads, think little of doing the Passaic leap nowadays, although occasionally the body of some luckless diver is found at the end of the gorge usually a week later. Picture No. 4 taken from the same spot looking northward shows pool, bathing place, the gorge and rapids below the falls, with an assortment of Paterson smokestacks, and the Soldiers and Sailors' monument crowning the lofty rock promontory which buttresses the falls, and sloping for some distance in a gradual elevation, dominates Paterson at the outlet of the gorge. Picture No. 5 shows the dam above the falls with part of the park.

In a small stone building overlooking the cataract, a civil and intelligent park keeper gave the information that in dry summers, the flow of water diminishes considerably, and when diverted for the mill races, is scarcely sufficient to supply the power needed, so that many mills have installed auxiliary steam power. At such times the falls degenerates into "a mere dribble" (corroborating previous information), but even then the narrow, rocky chasm-ravine is well worth exploration in waterproofs for the wonderful water worn formations presented. With the wet July of 1905, the flow was as ample as ever had been known and, he added "you are fortunate in seeing the falls under the best conditions." We agreed with him.

Edgar A. Cohen.



"SUNDAY"

W. and G. Parrish

# Practical Formulae for Plates, Papers, Etc.

**Pyro.**

## SEED PLATES.

By Weight.

A.

| | |
|---|---|
| Pure water | 16 oz. |
| Pyro | 1 oz. |
| Oxalic acid | 10 gr. |

B.

| | |
|---|---|
| Pure water | 16 oz. |
| Seed's C. P. sulphite of soda | 2 oz. |

C.

| | |
|---|---|
| Pure water | 16 oz. |
| Seed's C. P. carbonate of soda | 2 oz. |

Use

| | |
|---|---|
| A | 1 oz. |
| B | 1 oz. |
| C | 1 oz. |
| Pure water | 7 oz. |

By Hydrometer Test.

A.

| | |
|---|---|
| Pure water | 16 oz. |
| Pyro | 1 oz. |
| Oxalic acid | 10 gr. |

B.

| | | |
|---|---|---|
| Seed's sulphite soda solution | test | 60 dg. |
| Seed's carbonate soda solution | test | 50 dg. |

Use

| | |
|---|---|
| A | 1 oz. |
| B | 1 oz. |
| C | 1 oz. |
| Pure water | 7 oz. |

FACTOR 12.

In very cold dark rooms use 5 ounces of water. In hot weather use 10 ounces of water. For double-coated plates use 18 ounces of water.

One-half ounce of B will give a warmer tone to the negative. The best printers have a warm, brownish-black color. If negatives are too yellow or the shadows show the slightest stain, not due to discolored fixing bath, use 1½ ounces of B.

Sulphite of soda in solution does not keep well. Solutions over one month old should not be expected to be full strength if not made with pure water and kept in well stoppered bottles.

Hydrometers are seldom uniform. For this reason it is best to ascertain the reading of your instrument by making up solutions by weight, and then noting the reading, make future solutions accordingly. If crystal sodas are used, test with good clear crystals free from powder.

### Eikonogen-Hydrochinon.

By Weight.

A.

| | |
|---|---|
| Pure water | 48 oz. |
| Seed's C. P. sulphite of soda | 2 oz. |
| *Eikonogen | 240 gr. |
| Hydrochinon | 60 gr. |

B.

| | |
|---|---|
| Pure water | 16 oz. |
| Seed's C. P. carbonate soda | 2 oz. |

Use

| | |
|---|---|
| A | 3 oz. |
| B | 1 oz. |

By Hydrometer Test.

A.

| | | |
|---|---|---|
| Seed's C. P. sulphite of soda solution | test 20, | 48 oz. |
| *Eikonogen | | 240 gr. |
| Hydrochinon | | 60 gr. |

B.

| | | |
|---|---|---|
| Seed's carbonate soda solution | test | 50 dg. |

Use

| | |
|---|---|
| A | 3 oz. |
| B | 1 oz. |

*If more concentrated developer is desired in order to secure more contrast, the the water in solution A may be reduced to 32 ounces. Use boiling water in making up this developer. In cold weather a little glycerine could also be added to prevent precipitation.

(Factor 12.)

For double-coated plates add 4 ounces of pure water. Use more water in hot weather.

### Metol-Hydrochinon.

By Weight.

A.

| | |
|---|---|
| Pure water | 64 oz. |
| *Metol | 120 gr. |
| Hydrochinon | 120 gr. |
| Seed's C. P. sulphite of soda | 2 oz. |

B.

| | |
|---|---|
| Pure water | 16 oz. |
| Seed's C. P. carbonate of soda | 2 oz. |

Use

| | |
|---|---|
| A | 4 oz. |
| B | 1 oz. |
| Pure water | 4 oz. |

By Hydrometer Test.

A.

| | | |
|---|---|---|
| Pure water | | 48 oz. |
| *Metol | | 120 gr. |
| Hydrochinon | | 120 gr. |
| Seed's sulphite | test 60, | 16 oz. |

B.

| | | |
|---|---|---|
| Seed's carbonate soda solution | test | 50 dg. |

Use

| | |
|---|---|
| A | 4 oz. |
| B | 1 oz. |
| Pure water | 4 oz. |

*Dissolve in the order given. Metol should always be dissolved in water before the sulphite is added, or before it is mixed with sulphite solution, otherwise it may precipitate. If crystal sodas are used add 15 grains of bromide of potassium to 16 ounces of B solution.

(Factor 15.)

### Ortol.

A.

| | |
|---|---|
| Pure water | 24 oz. |
| Potassium meta-bisulphite | 90 gr. |
| Ortol | 180 gr. |

B.

| | |
|---|---|
| Pure water | 24 oz. |
| Seed's C. P. sulphite | 1 oz. |
| Seed's C. P. carbonate | 1 oz. |

Use equal parts of A and B.

(Factor 11.)

### Plain Fixing Bath.

By Weight.

| | |
|---|---|
| Pure water | 16 oz. |
| Hypo | 4 oz. |

By Hydrometer Test.

| | |
|---|---|
| Hydrometer | test. 70 dg. |

Do not use a discolored bath. Plates should be left in fixing bath at least double the time it takes whiteness to disappear. This bath must be made fresh every day.

### Acid Fixing Bath.

By Weight.

A.

| | |
|---|---|
| Pure water | 96 oz. |
| Hypo | 2 lb. |
| Seed's C. P. sulphite of soda | 2 oz. |

B.

| | |
|---|---|
| Pure water | 32 oz. |
| Chrome Alum | 2 oz. |
| Sulphuric acid C. P. | ¼ oz. |

By Hydrometer Test.

A.

| | | |
|---|---|---|
| Hypo | test 80, | 100 oz. |
| Seed's sulphite | test 60, | 16 oz. |

B.

| | | |
|---|---|---|
| Chrome alum | test 20, | 32 oz. |
| Sulphuric acid C. P. | | 2 dr. |

See that chemicals are entirely dissolved, then pour B into A slowly while stirring A rapidly. This bath remains clear and fixes clean after long-continued use, but should be replaced as soon as it becomes exhausted. Never attempt to restore a spent bath by adding more hypo. Plates should be left in bath at least double the time it takes whiteness to disappear.

If negatives remain 20 to 30 minutes in this bath, the film will become much hardened. This is a great advantage in summer when washing often softens the film. In hot weather fresh fixing baths should be made up more frequently. By fixing longer, less washing will suffice; 15 minutes in running water is enough if plates have been 30 minutes in a fresh, quick-working fixing bath.

### Weights.

The ounce avoirdupois (437½ grains) is the one used.

The quantities given in formulæ are mostly divisible by 4, if smaller quantities of developer are desired. The following approximate metric equivalents may be used :

| | |
|---|---|
| 16 oz. (fluid) | 500 cc. |
| 1 oz. (weight) | 30 grm. |
| 60 grains | 4 grm |

## Developers for Black-Tone Transparency and Lantern Plates.

### Metol-Hydro Developer.

A.

| | |
|---|---|
| Pure water | 16 oz. |
| Metol | 30 gr. |
| Hydrochinon | 30 gr. |
| Sulphite soda | 130 gr. |
| Citric acid | 10 gr. |

B.

| | |
|---|---|
| Pure water | 16 oz. |
| Potassium bromide | 15 gr. |
| Carbonate soda | 130 gr. |

Use Seed's or dry sodas. Crystal sodas may be substituted by using twice the weight given above. To develop use equal parts of A and B. Developer should be about 70 degrees F., and can be used repeatedly, but should be discarded as soon as discolored, as it then will stain the film.

### Developer for Warmer Toned Blacks.

A.

| | |
|---|---|
| Pure water | 16 oz. |
| Hydrochinon | 50 gr. |
| Sulphite soda (dry) | 20 gr. |
| Potassium bromide | 5 gr. |
| Citric acid | 5 gr. |

B.

| | |
|---|---|
| Pure water | 16 oz. |
| Carbonate soda (dry) | ½ oz. |
| Caustic soda | 30 gr. |

Use equal parts of A and B.

To make a lantern slide by contact, if a 16 c. p. electric lamp is used, the exposure for a medium dense negative should be about 5 seconds at a distance of 2 feet from the light. With the metol-hydro developer the image will appear in about 10 seconds, and development will be complete in from 30 to 40 seconds, according to density desired.

If the warm tone developer is used, expose somewhat longer than for the metol-hydro. Temperature of developer should be from 70 to 75 degrees F.

## Fixing Bath.

A.

| | |
|---|---|
| Pure water | 64 oz. |
| Hypo | 1 lb. |
| Sulphite of soda | 2 oz. |

B.

| | |
|---|---|
| Pure water | 16 oz. |
| Chrome alum | 1½ oz. |
| Sulphuric acid C. P. | 1 dr. |

While stirring A vigorously, pour in B. This bath keeps well. The chrome alum bath, recommended for our regular plate, can also be used. Leave plate in bath a few minutes after all white has disappeared from back. Wash well, and then wipe gently with a wad of wet absorbent cotton.

## STANLEY DRY PLATES.

### Formula for Developer.

No. 1.—Alkaline Solution.

| | | |
|---|---|---|
| Pure Water (fluid) | | 80 oz. |
| Sulphite of soda (crystals) | (Troy) | 6 oz. |
| Carbonate of soda (crystals) | (Troy) | 6 oz. |

No. 2.—Pyro Solution.

| | | |
|---|---|---|
| Water | | 80 oz. |
| Sulphuric acid | | ½ drm. |
| Pyro | (Troy) | 1 oz. |

For use mix the No. 1 and No. 2 in equal parts.
To make the same developer with hydrometer test :

| | |
|---|---|
| Carbonate of soda (hydrometer test 40°) | 40 oz. |
| Sulphite of soda (hydrometer test 40°) | 40 oz. |

Mix the two for alkaline solution and use pyro solution as above.

Increasing the pyro gives greater intensity; diminishing it, less. If the developer is used the second time, the negatives become more intense and develop more slowly after the first, so that a longer exposure is required if old developer is used. The temperature of the developer is of great importance. In cold weather it should be from 65° to 75°. In hot weather from 60° to 65°.

### Metol-Hydrochinon Developer.

No. 1.

| | |
|---|---|
| Water | 16 oz. |
| Metol | 30 gr. |
| Hydrochinon | 30 gr. |
| Sodium sulphite (crystals) | 240 gr. |

No. 2.

| | |
|---|---|
| Water | 10 oz. |
| Sodium carbonate (crystals) | 120 gr. |

Hydrometer Test:

No. 1.

| | |
|---|---|
| Sodium sulphite solution, to test 15 | 16 oz. |
| Metol | 30 gr. |
| Hydrochinon | 30 gr. |

No. 2.

Sodium corbonate solution to test 15.

For use, take one part No. 1, one part No. 2, and two parts water.

---

## EASTMAN'S DRY PLATES.

### Pyro Developer.

No. 1.

| | |
|---|---|
| Distilled or good well water | 16 oz. |
| Sulphite soda (crystals) | 4 oz. |
| Pyrogallic acid | 1 oz. |
| Sulphuric acid | 10 drops. |

No. 2.

| | |
|---|---|
| Water | 16 oz. |
| Sodium carbonate (crystals) | 4 oz. |

To develop take

| | |
|---|---|
| No. 1 | 1 oz. |
| No. 2 | 2 oz. |
| Water | 8 oz. |

In warm weather, use more water ; in cold, less. For Non-Halation Plates, use 16 ozs. water instead of 8 ozs.

### Metol-Hydrochinon Developer.

No. 1.

| | |
|---|---|
| Water | 16 oz. |
| Metol | 30 gr. |
| Hydrochinon | 30 gr. |
| Sodium sulphite (crystals). | 240 gr. |

No. 2.

| | |
|---|---|
| Water | 10 oz. |
| Sodium carbonate (crystals) | 120 gr. |

To develop take

| | |
|---|---|
| No. 1 | 1 oz. |
| No. 2 | 1 oz. |
| Water | 2 oz. |

### Acid Fixing Bath.

A.

| | |
|---|---|
| Water | 96 oz. |
| Hypo | 2 lb. |
| Sulphite of soda (crystals) | 4 oz. |

B.

| | |
|---|---|
| Water | 32 oz. |
| Chrome-alum | 2 oz. |
| Sulphuric acid | ¼ oz. |

Pour B into A, while stirring A rapidly. As the chrome-alum dissolves slowly a stock solution of B should be kept on hand.

### Summer Fixing Bath.

In hot weather the best prevention from softening of the film is to make a fresh Hypo bath each day just before it is needed.

After development, wash negative half a minute and immerse in clear saturated solution of alum five minutes, rinse, and fix in

| | |
|---|---|
| Hypo | 4 oz. |
| Water | 16 oz. |

**Note Following.**—The developer should be kept as close to the temperature of 65° F. as possible. See that your stock solutions are kept in well stoppered bottles.

A smaller quantity of sulphite of soda in developer will produce a warmer tone, a larger quantity, a gray or bluish black tone.

## STANDARD DRY PLATES.

**To Develop.**—Development should not be commenced until the eyes are somewhat accustomed to the light of the dark-room. As you flow the developer over the plate, commence to count seconds 0-1-2-3, etc. Note the time of the appearance of the high-lights of the image and multiply this time by the factor of the developer you are using. Different developers have different factors. The factor for the Standard Dry Plate Pyro Developer is 12; the image on a normally exposed plate with the developer at 70 degrees F. generally appears in 20 seconds, 20 x 12=240. At the end of 240 seconds (4 min.), including the 20 seconds before the image appeared, development will be completed. The high-lights of an over-exposed plate will appear quicker, and those of an under-exposed plate slower, than those of a normally-exposed plate. As soon as development is completed, rinse the plate free from developer and place it in the fixing bath. While any normal developer will work well with this system, we give those which we have used :

### Pyro Development Formula.

A.

| | |
|---|---|
| Water | 32 oz. |
| Oxalic acid | 20 gr. |
| Pyro | 1 oz. |

B.

| | |
|---|---|
| Sodium carbonate (crystals) | 4 oz. |

(If dry carbonate or sulphite is used take only one-half the weight.)

| | |
|---|---|
| Water | 16 oz. |

(Hydrometer test 40.)

C.

| | |
|---|---|
| Sodium sulphite (crystals) | 3 oz. |
| Water | 16 oz. |

When making solution A, dissolve the acid in the water and then add the pyro.

To develop Standard extra or Imperial portrait, take:

| | |
|---|---|
| A | 2 oz. |
| B | 1 oz. |
| C | 1 oz. |
| Water | 6 oz. |

(Development factor is 12.)

To develop Orthonon Plates, take:

| | |
|---|---|
| A | 2 oz. |
| B | 1 oz. |
| C | 1 oz. |
| Water | 12 oz. |

(Development factor is 12.)

The development of the Orthonon is the same as with the ordinary plate, except that more water is added, making the process of development much slower. Diluting the developer is necessary so that the action will not be too severe on the upper film before the developer has had time to penetrate through to the under one. It is necessary that both film should develop simultaneously.

To obtain greater or less contrast than the normal factor will give, it has been customary to increase or decrease the factor. A plan which has some advantages over this method is to add to, or deduct from, the time of appearance, as the case may require, and use the same factor. For instance, with our pyro developer, whose factor is 12, if the high-lights appeared in 20 seconds; for more contrast call it, say, 22 seconds, and for less contrast take a lower number, say 18 seconds.

If the plates are known to be over-exposed, add to each ounce of the developer *before* development two or more drops of the following bromide solution and develop for a length of time equal to that which it would take to develop it in a normal developer, plus the time it takes for the image to appear in the "bromide developer."

For example, if with a normal developer the high-lights appeared in 15 seconds, development would be completed in 15 x 12=180 seconds; but if on the over-exposed plate in the developer to which the bromide has been added the high-lights did not appear until 60 seconds, development would be completed in 180 + 60 = 240 seconds.

This method of developing over-exposures I believe will be found to be an improvement on the orthodox method of adding bromide and developing for the same length of time as without bromide. It is to a certain extent self-compensating, especially where considerable more than two drops of bromide solution to the ounce is used; for the more bromide is added the longer will be the image in appearing, and the length of time of development will be increased correspondingly. Where two drops or less of the bromide solution are used to each ounce of developer it is equally good to develop for the same length of time it would take to develop the plate if no bromide had been added.

D.

| | |
|---|---|
| Potassium bromide | 1 oz. |
| Water | 10 oz. |

For those who like a Metol Hydro developer we give the following:

| | |
|---|---|
| Water | 16 oz. |
| Sodium sulphite (crystals) | 1 oz. |
| Metol | 30 gr. |
| Hydrochinon | 60 gr. |
| Potassium bromide | 10 gr. |
| Sodium carbonate (crystals) | 1 oz. |

If the dry carbonate or sulphite is used, take only one-half the weight.

To develop, take one part to three parts water.

Development factor is 10.

**Hydrochinon.**—This developer is recommended for over-exposed plates :

A.

| | |
|---|---|
| Water | 16 oz. |
| Sodium sulphite (crystals) | 2 oz. |
| Hydrochinon | 160 gr. |

B.

| | |
|---|---|
| Water | 16 oz. |
| Sodium carbonate (crystals) | 4 oz. |
| Potassium bromide | 80 gr. |

---

## HAMMER PLATES.

The quantity of sodium sulphite in the developer must be regulated to produce the color desired. It is to the photographer's advantage, when using Pyro developer, to use this formula, as most other formulæ call for more Pyro than is necessary for these plates.

**Pyro and Soda.** By weight.

No. 1.

| English weights and measures. | Metric weights and measures. |
|---|---|
| 30 ounces pure water | or 900 c cm. |
| 5 ounces sodium sulphite (crystals) | or 150 grm. |
| 2½ ounces sodium carbonate (crystals) | or 75 grm. |

No. 2.

| | |
|---|---|
| 24 ounces pure water | or 720 c.cm. |
| 15 grains oxalic acid (dissolved) | or 1 grm. |

And then add

| | |
|---|---|
| 1 ounce pyrogallic acid | or 30 grm. |

To develop, take

| | | |
|---|---|---|
| 1 ounce of Solution No. 1 | or | 30 c cm. |
| ½ ounce of Solution No. 2 | or | 15 c.cm. |
| 6 to 8 ounces pure water | or | 180 to 240 c.cm. |

More water may be used in warm weather, and less water in cool weather.

## Pyro Developer with Carbonate of Potash.

No. 1.

| English weights and measures. | | Metric weights and measures. |
|---|---|---|
| 32 ounces pure water | or | 960 c.cm. |
| 8 ounces sodium sulphite (crystals) | or | 240 grm. |
| 1 ounce carbonate of potash (dry) | or | 30 grm. |

No. 2.

| | | |
|---|---|---|
| 24 ounces pure water | or | 720 c.cm. |
| 15 grains oxalic acid (dissolved first) | or | 1 grm. |
| 1 ounce pyrogallic acid | or | 30 grm. |

To develop, take

| | | |
|---|---|---|
| 1 ounce of Solution No. 1 | or | 30 c.cm. |
| ½ ounce of Solution No. 2 | or | 15 c cm. |
| 6 to 8 ounces of pure water | or | 180 to 240 c cm. |

When the plate is fully developed and you find the high lights too thin, use less water in the developer; if too dense, use more water.

**Pyro and Soda.** Three solutions by weight and by hydrometer.

This formula is better suited to all localities than is a two-solution developer. Each property of the developer being separate, the user can vary the quantity of either to meet local conditions. The water in some places is alkaline; then less of No. 2 carbonate of soda should be used. A few trials will indicate the amount that should be used in order to produce the best results. In cold weather the carbonate of soda can be increased a little. During hot weather it is generally best to use a little less of the No. 2 solution, for if the temperature is very high and too much of this chemical is present, the user will destroy the clearness of his plate. The sulphite being in a separate (No. 1) solution, the user can easily modify results by varying the proportion. The water in some localities does not require as much sulphite as in others. Use just enough of the sulphite solution to give the proper printing color to the negative (just a trace of yellow).

No. 1.

| English weights and measures. | | Metric weights and measures. |
|---|---|---|
| 15 ounces pure water | or | 450 c.cm. |
| 5 ounces sulphite of soda (crystals) | or | 150 grm. |
| Hydrometer test 80° | | |

No. 2.

| | | |
|---|---|---|
| 15 ounces pure water | or | 450 c.cm. |
| 2½ ounces carbonate of soda (crystals) | or | 75 grm. |
| Hydrometer test 40° | | |

No. 3.

| | | |
|---|---|---|
| 24 ounces pure water | or | 720 c.cm. |
| 15 grains oxalic acid | or | 1 grm. |
| 1 ounce pyrogallic acid | or | 30 grm. |

To develop, take

| | | |
|---|---|---|
| ½ ounce of each, No. 1, No. 2, No. 3 | or | 15 c.cm. |
| 6 to 8 ounces pure water | or | 180 to 240 c.cm. |

If the subject has strong contrasts of light and shadow, use a little less of No. 3 and a little more water than usual.

If the subject is flat and lacking in contrast, increase the amount of No. 3 and use a little less of No. 2; a few drops of bromide solution will be beneficial.

Keep developing solutions cool and use more water in hot weather.

Do not use a cold developer in cold weather. The water may be decreased when the temperature is low.

For Non-Halation (double-coated) Plates, use about one-third more water; the development will be slower, but the results will justify the extra time spent in this way.

**Pyro-Metol-Tolidol Developer.**—"This is a good developer; some think it has no equal."—Eppert.

No. 1.

| | |
|---|---|
| Sulphite of soda | testing 60° |

No. 2.

Is made by mixing together equal quantities of

| | |
|---|---|
| Carbonate of soda | testing 60° |
| Carbonate of potash | testing 60° |

No. 3.

| | |
|---|---|
| Water | 11 oz. |
| Pyro | ½ oz. |
| Metol | 120 gr. |
| Tolidol | 120 gr. |
| Citric acid | 60 gr. |
| One ounce of No. 1 (sulphite testing 60°) | |

To develop, take

| | |
|---|---|
| Water | 6 to 10 oz. |
| No. 1 | ½ oz. |
| No. 2 | ½ oz. |
| No. 3 | 2 to 4 drm. |

During the warm weather leave out the carbonate of soda in No. 2, using the carbonate of potash (testing 60° by hydrometer) alone.

**Metol and Hydrochinone Developer.**

No. 1.

| English weights and measures. | | Metric weights and measures. |
|---|---|---|
| 80 ounces of pure hot water | or | 2400 c.cm. |
| 1 ounce of metol | or | 30 grm. |
| ⅛ ounce of hydrochinone | or | 4 grm. |
| 6 ounces of sulphite of soda (crystals) | or | 180 grm. |

No. 2.

| | | |
|---|---|---|
| 80 ounces of pure water | or | 2400 c.cm. |
| 5 ounces of carbonate of soda (crystals) | or | 150 grm. |

To develop, take

| | | |
|---|---|---|
| 2 ounces of pure water | or | 60 c.cm. |
| 1 ounce of Solution No. 1 | or | 30 c.cm. |
| 1 ounce of Solution No. 2 | or | 30 c.cm. |

**Eikonogen-Hydrochinone Developer.** As used on Hammer Plates by prominent photographers. Very fine.

No. 1.

| English weights and measures. | | Metric weights and measures. |
|---|---|---|
| 64 ounces pure water | or | 1920 c.cm. |
| 1 ounce of eikonogen | or | 30 grm. |
| ⅛ ounce of hydrochinone | or | 4 grm. |
| 2½ ounces of sulphite of soda (crystals) | or | 75 grm. |

No. 2.

| | | |
|---|---|---|
| 64 ounces of pure water | or | 1920 c.cm. |
| 2½ ounces of carbonate of potash (dry) | or | 75 grm. |

To develop, take

| | | |
|---|---|---|
| 2 ounces of Solution No. 1 | or | 60 c.cm. |
| 1 ounce of Solution No. 2 | or | 30 c.cm. |

And old developer (solution previously used) in sufficient quantity to produce best results.

### Pyro and Metol Developer.

No. 1.

| English weights and measures | | Metric weights and measures |
|---|---|---|
| 57 ounces of pure water | or | 1710 c.cm. |
| 2½ ounces of sulphite of soda (crystals) | or | 75 grm. |
| 1 ounce of metol | or | 30 grm. |

No. 2.

| | | |
|---|---|---|
| 57 ounces of pure water | or | 1710 c.cm. |
| 2½ ounces of sulphite of soda (crystals) | or | 75 grm. |
| ¼ ounce of pyrogallic acid | or | 8 grm. |

No. 3.

| | | |
|---|---|---|
| 57 ounces of pure water | or | 1710 c.cm. |
| 2½ ounces of carbonate of potash | or | 75 grm. |

To develop, take

| | | |
|---|---|---|
| 3 ounces of pure water | or | 90 c.cm. |
| 1 ounce of Solution No. 1 | or | 30 c.cm. |
| 1 ounce of Solution No. 2 | or | 30 c.cm. |
| 1 ounce of Solution No. 3 | or | 30 c.cm. |

This developer may be used repeatedly, by adding a little fresh developer as required.

Keep the used developer in a separate bottle. It combines the desirable qualities of metol and pyro, and gives an ideal negative.

### Acid Fixing Bath.

Owing to the quality of the water in some localities, some workmen prefer an acid fixing bath. The following is good and remains clear (mix in order given):

| | |
|---|---|
| Water (about) | 120 oz. |
| Sulphuric acid | 3 dr. |
| Sulphite of soda | 4 oz. |

When dissolved, add

| | |
|---|---|
| Hyposulphite of soda | 2 lb. |
| Water to make | 160 oz. |

### Acid Chrome-Alum Fixing Bath.

This kind of a bath has been in use for years and is preferred by many (mix only in the order given):

| | |
|---|---|
| Water (about) | 100 oz. |
| Sulphuric acid | 3 dr. |
| Sulphit of soda | 4 oz. |

When dissolved, add

| | |
|---|---|
| Hyposulphite of soda | 2 lb. |

Dissolve and then add chrome-alum from 1 to 2 ounces, previously dissolved in 20 ounces of water. Then add water to make 160 ounces.

## CRAMER PLATES.

**Pyro-Acetone Developer.**—Can be used in warm climates without ice. Does not stain the hands.

No. 1.

| | | |
|---|---|---|
| Pure Water | Hydrometer test 80 | 20 oz. |
| Cramer's dry sulphite of soda | | 3 oz. |
| Pyrogallic acid | | 1 oz. |

(½ oz. of Pyro and ½ oz. of Edinol may be used in place of 1 oz. Pyrogallic acid.)

Use melted ice or boiled water cooled and filtered.

This solution works best while fresh. It can be used as long as it stays clear.

If it is to be kept a long time, put it in bottles, quite full and tightly corked, to prevent discoloration.

No. 2.

| | |
|---|---|
| Cramer's (liquid) acetone | 1 oz. |
| Water | 20 oz. |

For use mix the following proportions:

| | |
|---|---|
| No. 1 | 1 oz. |
| No. 2 | 10 oz. |

Use enough developer to keep the plate well covered, and rock the tray gently while developing.

While plates can be developed in succession by discarding a part of the used developer, each time, and making it up to the original bulk with fresh.

Do not keep the plate out of the developer too long when examining it, or streaks will form.

While with other developers, the lights appear first and then the shadows; with this developer they appear simultaneously as though the plate had been over-exposed, but by continued development, the lights gain gradually in intensity, and as soon as sufficiently dense, development should be stopped.

For short exposures use fresh developer, and, if negative shows under-exposure, transfer it without rinsing to a tray containing solution No. 2, until all the detail is out, then finish developing in the normal solution.

The development of over-exposed plates can be checked by the use of old developer, or by transferring them quickly to a tray containing a solution of bromide of potassium (1 to 50), and then back to normal developer.

For white drapery, place the plate first in a solution of bromide of potassium (1 to 50) for about half a minute, and then, without rinsing, transfer to normal developer,

When development is completed rinse the negative and place in the acid fixing and hardening bath.

If negatives turn yellow after fixing and washing, it is due to decomposition of the fixing bath.

Remedy: Make up a new bath.

**Pyro Developer.**

A.

| | | Metric. |
|---|---|---|
| Pure Water | 16 oz. | 640 c.cm. |
| Oxalic acid | 12 gr. | 1 grm. |
| Pyrogallic acid | 1 oz. | 40 grm. |

B.

| | | |
|---|---|---|
| Pure Water, | 16 oz. | 640 c.cm. |
| Cramer's dry sulphite of soda | 2 oz. | 80 grm. |

(Which will test 60° by hydrometer.)

If negatives are too yellow use more sulphite.

C.

| | | |
|---|---|---|
| Pure Water | 16 oz. | 640 c.cm. |
| Cramer's dry carbonate of soda | 1 oz. | 40 grm. |
| (Which will test 30° by hydrometer.) | | |

If Cramer's dry carbonate of soda is used, solution C, as given above, is of the proper strength. When other brands are used it may be necessary to vary the strength of this solution, bearing in mind that an excess of carbonate blocks the lights, and increases contrasts.

Mix for immediate use :

| | |
|---|---|
| A | 1 oz |
| B | 1 oz. |
| C | 1 oz. |
| Water (65° to 70° F.) | 10 oz. |

In summer the developer should be used cooler (about 60° F.), or with more water.

In winter it should be used warmer (about 75°), or with less water.

Less water hastens development and increases contrast.

More water slows development, gives less contrast and is better for short exposures.

### Edinol Developer.

A.

| | | Metric. |
|---|---|---|
| Pure Water | 30 oz. | 900 c.cm. |
| Cramer's dry sulphite of soda | 2 oz. | 60 grm. |
| (Which will test 32° by hydrometer.) | | |
| Acetone—sulphite | ¼ oz. | 8 grm. |
| Edinol | 1 oz. | 30 grm. |

B.

| | | |
|---|---|---|
| Pure Water | 30 oz. | 900 c.cm. |
| Carbonate of potassium | 4 oz | 120 grm. |
| (Which will test 50° by hydrometer.) | | |

For use :

| | |
|---|---|
| A | 1 oz. |
| B | 1 oz. |
| Water | 6 to 10 oz. |

This developer can be used several times in succession, and keeps well.

**Contrast Developer.**—For developing over-exposed plates.

Also useful as an addition to normal developer in case same does not work with sufficient brilliancy, for which purpose the addition of a few drops is sufficient.

| | | Metric. |
|---|---|---|
| Pure Water | 30 oz. | 1,500 c.cm. |
| Cramer's dry sulphite of soda | 1 oz. | 50 grm. |
| (Which will test 16° by hydrometer.) | | |
| Edinol | 100 gr. | 10 grm. |
| Bromide of potassium | 20 gr. | 120 grm. |
| Carbonate of potassium | ½ oz. | 25 grm. |

Use full strength.

This solution can be used repeatedly.

As soon as a plate shows over-exposure in the normal developer, rinse and place in the dish containing the contrast developer and develop until sufficiently intense.

### Acid Fixing and Hardening Bath.

A.

| | | Metric. |
|---|---|---|
| Water (1 gallon) | 128 oz. | 4 litre. |
| Hyposulphite of soda | 32 oz. | 1 kilo. |
| (Which will test about 80° by hydrometer.) | | |

B.

| | | |
|---|---|---|
| Water | 32 oz. | 1 litre. |
| Cramer's dry sulphite of soda | 3 oz. | 90 grm. |
| (Which will test 45° by hydrometer ) | | |
| Sulphuric acid C P | ½ oz. | 15 c.cm. |
| Powdered chrome alum | 2 oz. | 60 grm. |

Note : Be sure to mix solution B *exactly* in given proportions and rotation.

Always pour B into A while stirring well. If this is not done precipitation will take place.

During the cold season one-half the quantity of Solution B is sufficient for full quantity of Solution A.

B can also be prepared as follows :

| | | Metric. |
|---|---|---|
| Water | 32 oz. | 1 litre. |
| Potassium metabisulphite | 3 oz. | 90 grm. |
| Powdered chrome alum | 2 oz. | 60 grm. |

This bath remains clear after frequent use, does not discolor the negatives, and hardens the film to such a degree that the negatives can be washed in warm water and dried by artificial heat if necessary. They should be left in the bath ten to twenty minutes after the bromide of silver appears to have been dissolved to insure permanency, freedom from stain and perfect hardening.

If the bath becomes exhausted by continued use, replace it by a new one.

**Plain Fixing Bath.**

| | | Metric. |
|---|---|---|
| Water | 32 oz. | 1 litre. |
| Hyposulphite of soda | 8 oz. | 250 grm. |
| (Which will test about 80° by hydrometer.) | | |

Do not use the bath when it is discolored, it must be made fresh each day.

## LUMIÈRE DRY PLATES.

**Developer.**

Lumière's Diamidophenol.

| | | |
|---|---|---|
| Water | 1000 grms. or parts | 32 oz. |
| Anhydrous sodium sulphite | 30 " " | 1 oz. |
| Diamidophenol | 5 " " | 15 gr. |

Anhydrous sodium sulphite may be substituted for twice as much sodium sulphite in crystals.

The relative proportion of sulphite and diamidophenol may be measured in volume by using three parts of sulphite for one of diamidophenol.

A stock solution of sulphite may also be advantageously used, but it retains its strength only for a week, beyond that time its strength decreases gradually without any apparent change.

The following formula will be found to give good results :

| | | |
|---|---|---|
| Water | 1000 grms. or parts | 32 oz. |
| Anhydrous sodium sulphite | 30 " " | 1 oz. |

For every ounce of the stock solution add at the time of use 2½ grains of diamidophenol.

This developer is remarkably rapid in action (3 to 4 minutes' develment for a well-timed negative) and will be found especially valuable for the development of instantaneous exposures, while by regulating the proportion of sulphite to diamidophenol great power of control is acquired. For under-exposure increase proportion of sulphite; for over-exposure increase proportion of diamidophenol.

The solution is ready for use in a minute, and must be prepared just before use in order to have all its strength.

For black tones lantern slides, double the quantity of diamidophenol and add 5 grammes (or 75 grains) of a 10 per cent. solution of bromide.

For portrait work add twice as much water.

### Pyro-Soda.

A – Pyro-Solution.

| | | | |
|---|---|---|---|
| Pure Water | 1000 grms. | or parts | 32 oz. |
| Pyrogallic acid | 30 " | " | 1 oz. |
| Oxalic acid | 1 " | " | 15 gr. |

B - Soda Solution.

| | | | |
|---|---|---|---|
| Water | 300 grms. | or parts | 10 oz. |
| Carbonate of soda (dry) (1) | 30 " | " | 1 oz. |
| Anhydrous sodium sulphite (1) | 75 " | " | 5½ gr. |

Anhydrous sodium sulphite may be substituted by twice as much sodium sulphite in crystals.

Dry carbonate of soda may be substituted by two to three times as much carbonate in crystals.

For immediate use take

| | | | |
|---|---|---|---|
| A | 30 c. c. | or grms. | 1 oz. |
| B | 30 c. c. | " | 1 oz. |
| Water | 150 to 250 c. c. | " | 5 to 8 oz. |

or by hydrometer:

| | | | |
|---|---|---|---|
| A | 30 c. c. | or grms. | 1 oz. |
| Sodium sulphite solution (test 60) | 60 c. c. | " | 2 oz. |
| Carbonate of soda (test 40) | 30 c. c. | " | 1 oz. |
| Water | 100 to 200 c. c. | " | 3 to 6 oz. |

The quantity of water should be regulated according to result desired; the more water the finer gradation and detail. In warm weather use developer diluted and cool (temperature not over 60 F.)

Bromide may be used as a restrainer.

**Fixing.**—After rinsing, the plate should be immersed in the following fixing bath and allowed to remain a few minutes after all milky patches have disappeared from the back :

| | | | |
|---|---|---|---|
| Water | 1000 grms. | or parts | 32 oz. |
| Hyposulphite of soda | 250 " | " | 8 oz. |
| Bisulphite of soda | 25 " | " | 1 oz. |

or preferably :

| | | | |
|---|---|---|---|
| Water | 1000 grms. | or parts | 32 oz. |
| Lumière's fixing salts | 1 package. | | |

In hot weather add 40 grammes or parts of alum, and use the solution twenty-four hours after making.

**Washing** should be thorough in order to remove all traces of hypo, either in running water for two hours, or a succession of changes, or by using a hypo eliminator. This latter method is rapid, certain and effective, if Lumière's Thioxydant be employed.

## EASTMAN'S NON-CURLING FILM.

Those who are accustomed to the use of the regular films should bear in mind the following facts when manipulating Eastman's N. C. Film :

1. N. C. Film being coated on the back with gelatine, neither side must come in contact with anything while drying. Note special directions for drying.

2. As N. C. Films are very rapid and are orthochromatic they should be handled carefully in the dark room with safe ruby light, or developed in either the Kodak Tank Developer or Kodak Developing Machine to avoid fogging.

3. N. C. Film will not curl and the glycerine bath is, therefore, entirely unnecessary.

4. N. C. Films must be fixed in an acid fixing bath or else immersed in an alum bath after fixing.

**Preparing for Development.**—For best results use the Kodak Tank Developer or the Kodak Developing Machine. The acid fixing bath must be used or films must be soaked in alum bath for fully five minutes and dried as per directions herein. Those who prefer the dark-room method of development should, however, proceed as follows·

The development of cartridge films in the strip. The operator can readily handle a 12 exposure strip up to and includiug the 3¼ x 4¼ size. In the larger sizes those desiring to follow the strip method of development should use the 6 exposure cartridges if they find the longer ones cannot be conveniently handled.

### Strip Development.

1. Unroll the film and detach the entire strip of film from the black paper, taking care not to touch the face of the film in so doing.

2. Pass the film, face down, through the tray of clean, cold water, holding one end in each hand. Pass through the water several times, that there may be no bubbles remaining on film. When it is thoroughly wet, with no air bubbles, place the strip of film in a pail or wash-bowl of clean, cold water, which is large enough so that the film may be immersed fully without folding tightly enough to crack it.

3. Now prepare the developer and pass the film through it in the same manner as described for wetting it. Keep it constantly in motion, and in about one minute the high-lights will begin to darken, and you will readily be able to distinguish the unexposed sections between the negatives. Complete development in the strip, giving sufficient length of development to bring out what detail you can in the thinnest negatives. There is no harm in having your negatives of different density —this can be set right in the printing. The difference in density does not affect the difference in contrast.

### Pyro Formula.

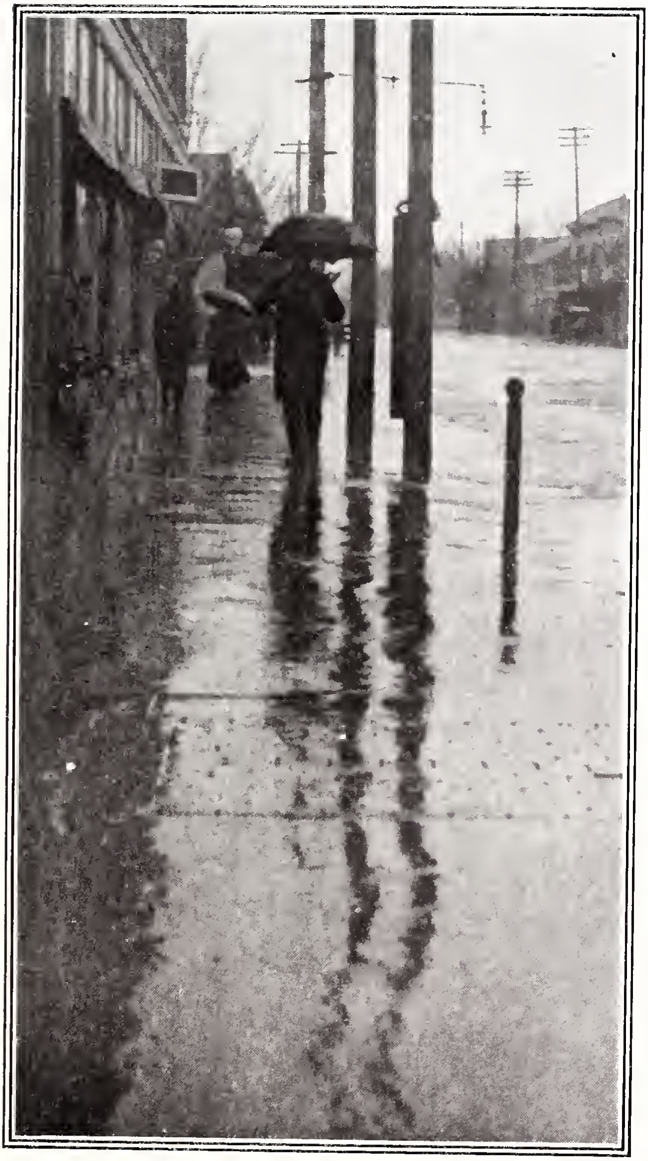
Pyrogallic Acid Solution.

| | |
|---|---|
| Pyrogallic acid | 1 oz. |
| Sulphuric acid | 20 min. |
| Water | 28 oz. |

Soda Solution.

| | |
|---|---|
| *Sulphite of soda (anhydrous) | 3 oz. |
| *Carbonate of soda (anhydrous) | 2 oz. |
| Water | 28 oz. |

*If "crystals" are used double the quantity.



A RAINY DAY

**F. M. Braddock**

For dark-room development take:

| | |
|---|---|
| Pyro solution | ½ oz. |
| Soda solution | ½ oz. |
| Water | 4 oz. |

(This developer will then contain 1.56 grains Pyro per ounce.)

For Kodak Developing Machine (6 minute development), or Kodak Tank Developer (10 minute development) take the following proportions:

| | |
|---|---|
| Pyro solution | 1 oz. |
| Soda solution | 1 oz. |
| Water | 10 oz. |

(This developer will then contain 1.30 grains Pyro per ounce.)

For Kodak Tank Developer (20 minute development) take the following proportions:

| | |
|---|---|
| Pyro solution | 1 oz. |
| Soda solution | 1 oz. |
| Water | 22 oz. |

(This developer will then contain .65 grains Pyro per ounce.)

**Fixing Bath.**

| | |
|---|---|
| Kodak Acid Fixing Powder | 4 oz. |
| Water | 16 oz. |

Or the acid fixing bath may be prepared as follows if desired:

| | |
|---|---|
| Water | 16 oz. |
| Hyposulphite of soda | 4 oz. |
| Sulphite of soda (anhydrous) | 80 grs. |

When fully dissolved add the following hardener:

| | |
|---|---|
| Powdered alum | ⅛ oz. |
| Citric acid | ⅛ oz. |

This bath may be made up at any time in advance and may be used so long as it retains its strength, or is not sufficiently discolored by developer carried into it as to stain the negatives.

If a plain hypo bath be used the negatives must be rinsed in three changes of water and transferred to a saturated solution of common alum for full five minutes, then washed. This applies also, of course, to machine or tank developed negatives.

NOTICE. All photographic chemicals are bought and sold by avoirdupois and above formulæ are prepared accordingly.

**Drying N. C. Film Negatives.**—When thoroughly washed, remove the surplus water from the negatives with a squeegee of soft, damp cloth. Another easy method, when negatives are developed in the strip, is to draw the first one side up and then the other across the smooth edge of either a porcelain or enameled bath tub, or, for that matter, across any smooth, rounding surface, such as the edge of a china wash bowl. Be sure to remove *all surplus moisture* and "tear drops" before hanging up to dry.

Having removed the surplus water, snap an Eastman Film Developing Clip on each end of the strip and hang it up to dry, being sure that it swings clear of the wall so that there will be no possibility of either side of the film coming in contact with the latter. In drying, N. C. Film should be cut up into strips of *not more* than six exposures in length.

If the film has been cut up, pin by one corner to the edge of a shelf or hang the negatives on a stretched string by means of a bent pin, running the pin through the corner of the film to the head, then hooking it over the string.

Always keep finished negatives flat—*do not roll them up*,

# ANSCO NON-CURLING CARTRIDGE FILM.

The development of Ansco Non-Curling Film does not differ very much from the regular Film. The same developer may be used; but it must be fixed in an Acid Fixing Bath or immersed in the Alum Bath previous to washing in order to avoid stains, and also to harden the gelatine coating on the back of the Film, especially during hot weather.

The difference between the regular Film and the Non-Curling Film can be summed up as follows:

Ansco Non-Curling Film will not curl and the glycerine bath is therefore entirely unnecessary.

Non-Curling Film being coated on the back with gelatine, neither side must come in contact with anything while drying.

Non-Curling Film must be fixed in an Acid Fixing Bath or else immersed in an Alum Bath after fixing.

**Developing.**—Ansco Non-Curling Film may be developed either in the strip or cut into one or more exposure lengths.

To develop in the strip remove the film from the black paper, allowing film to roll up loosely. Hold this roll by the end with thumb and second finger of the left hand, and take hold of the free end of the film with the right. Place the film in the developer, which has been previously prepared, and at once begin to pull the film from the roll, holding the film down in the developer with the index finger of the left hand. When the whole length has been unrolled, take hold of the last end of the film with the left hand and pass it back and forth through the developer until the development is completed.

To avoid transparent spots, as soon as the film has been passed through the developer the first time, face down, reverse it face up, and, holding the film down in the tray, draw the film through the developer under the hand. This breaks all the air bubbles and a perfect negative will result. Transparent spots are caused by air bubbles adhering to the film during development.

When fully developed rinse in water and immerse in the fixing bath, or if a small tray is used, pass film through fixing bath in the same manner as in development until the white appearance has entirely disappeared. The film strip may now be washed and hung up to dry, according to special directions for drying.

Much time and trouble is saved by this method, and the results, even with widely different exposures, compare favorably with those obtained by developing the film separately, although the most exacting results are to be obtained by developing the films separately.

To develop in one or more exposure lengths, separate the film into lengths by cutting through the points indicated on the black paper. Place the films in the developer one at a time, face down, and move each one about so that all air bubbles may be broken before another film is added. In this manner six or more pieces may be developed at one time.

When development is completed, wash in two changes of water and fix the same as strip development. Wash half an hour in running water, or in eight or ten changes of water, and hang up to dry as recommended in special directions for drying.

**Machine Development.**—The Ansco Film Cartridges are ready prepared for machine development by means of a patented device.

This device consists of a lock cut in the end of the film and longitudinal slots in the black paper. The slots allow the film to move freely enough to prevent bunching in the camera and yet hold the film sufficiently secure to the black paper for machine development. This method of fastening the film to the black paper obviates the necessity of unwinding the black paper after exposure to fasten the free end of the film.

**Drying Non-Curling Films.**—Attach an Ansco Film Clip to each end of the film and hang it up on a line, being careful that neither side comes in contact with anything.

In practice it is found desirable to remove the surplus water from the emulsion side of the film. This may be done with a squeegee or by drawing the emulsion side of the film across the smooth edge of a tray, or any other rounded surface.

In drying Non-Curling Films, they should be cut up into strips of not more than six exposures in length.

If the film has been cut up, pin by one corner to the edge of a shelf or hang the negatives on a stretched string by means of a bent pin, running the pin through the corner of film to the head, then hooking it over the string.

Always keep finished negatives flat. Do not roll them up.

## Developing Formulæ.

### Metol-Hydro.

| | | |
|---|---|---|
| 2000 c. c. | Water | 60 oz. |
| 4 grms. | Metol | 60 gr. |
| 125 grms. | Soda sulphite (granulated) | 4 oz. |
| 60 grms. | Soda carbonate (granulated) | 2 oz. |
| 2 grms. | Hydrochinon | 30 gr. |
| ⅓ grms. | Potash bromide | 5 gr. |

Add chemicals in the order given.

### Pyro.—No. 1.

| | |
|---|---|
| Water | 24 oz. |
| Soda sulphite (crystals) | 2 oz. |
| Citric acid | 60 gr. |
| Bromide ammonia | 20 gr. |
| Pyrogallic acid | 1 oz. |

### No. 2.

| | |
|---|---|
| Water | 24 oz. |
| Soda sulphite (crystals) | 2 oz. |
| Potash carbonate | 3 oz. |

For exposures correctly timed, mix No. 1, 1 dram ; No. 2, 1 dram water, 2 oz.

### Fixing Bath.

| | |
|---|---|
| Water | 16 oz. |
| Hyposulphite soda | 4 oz. |
| Sulphite soda (anhydros) | 80 gr. |

When fully dissolved, add the following hardener:

| | |
|---|---|
| Powdered alum | ⅛ oz. |
| Citric acid | ⅛ oz. |

If a plain hypo bath be used, the negatives must be rinsed in three changes of water and transferred to a saturated solution of common alum for full five minutes, then washed.

# GENERAL FORMULAE FOR DRY PLATES.

## PYROL

### Formula for Seed Plates.

No. 1.

| | |
|---|---|
| Distilled or good well water | 16 oz |
| Sulphite soda | 4 oz. |
| Pyrol | 1 oz. |
| Sulphuric acid | 10 drops |

No. 2.

| | |
|---|---|
| Water | 16 oz. |
| Sal soda (crystals) | 4 oz. |

To develop, take

| | |
|---|---|
| No. 1 | 1 oz. |
| No. 2 | 1 oz. |
| Water | 8 oz. |

### Formula for Cramer Plates.

No. 1.

| | |
|---|---|
| Water | 6 oz. |
| Sulphite soda | 1 drm. |

Add acetic acid to turn Litmus Paper red, and then add

| | |
|---|---|
| "Pyrol" | 1 oz. |

No. 2.

| | |
|---|---|
| Water | 60 oz. |
| Carbonate soda (crystals) | 5 oz. |
| Sulphite soda | 10 oz. |

To develop, take

| | |
|---|---|
| No. 1 | 1 drachm. |
| No 2 | 1 oz. |
| Water | 3 to 4 oz. |

### Formula for Stanley Plates.

No. 1.

| | |
|---|---|
| Water | 80 oz. |
| Sulphite soda, (crystals) | 6 oz. |
| Carbonate soda (crystals) | 6 oz. |

No. 2.

| | |
|---|---|
| Water | 80 oz. |
| Sulphuric acid | ½ drachm. |
| "Pyrol" | 1 oz. |

To develop, take equal parts of No. 1 and No. 2.

---

### Bothamley's Pyro Developer. A. Stock Pyro Solution.

| | |
|---|---|
| Metabisulphite of potassium | 1 oz. |
| Water | 8 oz. |
| Pyrogallic acid | 1 oz. |
| Water | to make 10 oz. |

B

| | |
|---|---|
| Stock pyro solution | 1 oz. |
| Water | 10 oz. |

C

| | |
|---|---|
| Carbonate of sodium crystals | 1 oz. |
| Sulphite of sodium | 1 oz. |
| Bromide of potassium | 10 gr. |
| Water | to make 10 oz. |

For use mix equal parts B and C.

### Imperial Standard Developer: A

| | |
|---|---|
| Metabisulphite of potassium | 120 gr. |
| Pyrogallic acid | 55 gr. |
| Bromide of potassium | 20 gr. |
| Metol | 45 gr. |
| Water | 20 oz. |

B

| | |
|---|---|
| Carbonate of soda | 4 oz. |
| Water | 20 oz. |

For use mix equal parts A and B.

### Bardwell's Pyro-Acetone Developer.

| | |
|---|---|
| Water | 4 oz. |
| Sulphite of sodium (saturated solution) | 4 dr. |
| Acetone | 2 dr. |
| Pyro | 10 grms. |

### Metol.

Solution A.

| | |
|---|---|
| Water | 32 oz. |
| Metol | 4 drm. |

When dissolved add

| | |
|---|---|
| Sulphite soda (crystals)<br>(or C. P. dry 2½ oz.) | 5 oz. |

Solution B.

| | |
|---|---|
| Water | 32 oz. |
| Carbonate soda (crystals)<br>(or C. P. dry 2½ oz.) | 5 oz. |
| Bromide potassium | 25 gr. |

For use take equal parts A and B.

### One Solution Developer.

| | |
|---|---|
| Water | 32 oz. |
| Metol | 4 drm. |

When dissolved add

| | |
|---|---|
| Sulphite soda (crystals)<br>(or C. P. dry 2½ oz.) | 5 oz. |
| Carbonate potash | 5 drm. |
| Bromide potassium | 15 gr. |

For use take 1 part developer and add 1 to 2 parts water.

### Ortol Developer.

Solution A.

| | |
|---|---|
| Water | 20 oz. |
| Metabisulphite of potassium | 65 gr. |
| Ortol | 135 gr. |

Solution B.

| | |
|---|---|
| Water | 20 oz. |
| Carbonate soda (crystals)<br>(or C. P. dry 1¼ oz.) | 2½ oz. |
| Sulphite soda (crystals)<br>(or C. P. dry 1 oz 6 drm.) | 3¾ oz. |
| Bromide potassium | 8 gr. |

For use take equal parts A and B and an equal bulk of water.

### Glycin Developer.

| | |
|---|---|
| Hot water | 20 oz. |
| Sulphite soda (crystals) | 5 oz. |
| (or C. P. dry 2½ oz ) | |
| Carbonate potash | 5 oz. |
| Glycin | 1 oz. |

Dissolve in the hot water in order given. For use take 1 part solution to 3 to 5 parts water.

**Adurol-Hauff.** One solution.

| | |
|---|---|
| Water | 10 oz. |
| Sulphite of sodium (crystals) | 4 oz. |
| Carbonate of potassium | 3 oz. |
| Adurol | ½ oz. |

Two solution.

Solution A.

| | |
|---|---|
| Water | 20 oz. |
| Sulphite soda (crystals) | 4 oz. |
| (or C. P. dry 2 oz.) | |
| Adurol | 175 gr. |

Solution B.

| | |
|---|---|
| Water | 20 oz. |
| Carbonate potash | 2½ oz. |

For use take 1 part A, 1 part B and 1 part water. In hot weather, or when plates are inclined to fog, add 5 to 10 drops of 10 per cent. solution of bromide potassium.

### Hydrokinone-Hauff.

Solution A.

| | |
|---|---|
| Water | 10 oz. |
| Sulphite soda (crystals) | 2 oz. |
| (or C. P. dry 1 oz.) | |
| Hydrokinone | 40 gr. |

Solution B.

| | |
|---|---|
| Water | 10 oz. |
| Carbonate potash | 1¼ oz. |

For use take equal parts A and B. Add a few drops of 10 per cent. solution of bromide potassium if there is any tendency to fog.

**Hydrokinone.** One solution.

| | |
|---|---|
| Water | 10 oz. |
| Sulphite soda (crystals) | 2 oz. |
| (or C. P. dry 1 oz.) | |
| Hydrokinone-Hauff | ½ oz. |
| Carbonate potash | 4 oz. |
| Bromide potassium | 10 gr. |

For use take 1 part solution and add 4 to 6 parts water. This developer keeps well and can be used repeatedly.

### Formulæ for Transparencies and Lantern Slides.

Black Tones.

| | | |
|---|---|---|
| Water (distilled) | | 20 oz. |
| Hydrokinone-Hauff | | 60 gr. |
| Sulphite soda | dry | 1 oz., or |
| | crystals | 2 oz. |
| Carbonate soda | dry | 3 oz., or |
| | crystals | 6 oz. |
| Bromide potash | | 40 gr. |

### For Imperial Lantern Plates—No. 1.

| | |
|---|---|
| Hydrokinone-Hauff | 150 gr. |
| Metabisulphite potash | 10 gr. |
| Bromide potash | 50 gr. |
| Water | 20 oz. |

### No. 2.

| | | |
|---|---|---|
| Sulphite soda | dry | 1 oz., or |
| | crystals | 2 oz. |
| Caustic soda | | 100 gr. |
| Water | | 20 oz. |

For use take equal parts Nos. 1 and 2.

## Metol-Hydrokinone Formula for Lantern Plates.

| | | |
|---|---|---|
| Metol-Hauff | | ¼ oz. |
| Hydrokinone-Hauff | | ¼ oz. |
| Water (boiled) | | 80 oz. |
| Sulphite soda | dry | 2 oz., or |
| | crystals | 4 oz. |
| Carbonate soda | dry | 1¼ oz., or |
| | crystals | 2⅛ oz. |

For use take 2 parts developer and add 1 part water. For greater softness increase quantity of water, or use without dilution if contrast is required.

## Imogen Developer.

### A

| | |
|---|---|
| Hot water | 9 oz. |
| Sulphite of sodium crystals | 385 gr. |
| Imogen | 123 gr. |

### B

| | |
|---|---|
| Hot water | 4½ oz. |
| Carbonate of sodium | 2 oz. |

For use take 2 ounces A and 1 of B.

## Diogen Developer.

| | |
|---|---|
| Water | 9 oz. |
| Sulphite of sodium | 3½ oz. |
| Diogen | 7 dr. |
| Carbonate of potassium | 4½ oz. |

For normal exposure take 4 drams of this solution; dilute with 2 ounces, 1 dram of water, and add 2 drops bromide of potassium 10 per cent. solution.

## Metacarbol Developer.

| | |
|---|---|
| Metacarbol | 25 gr. |
| Sulphite of soda crystals | 100 gr. |
| Caustic soda | 50 gr. |
| Water | 10 oz. |

Dissolve the metacarbol in water, then add the sulphite, and when dissolved add the caustic soda and filter.

# INTENSIFIERS AND REDUCERS.

## Intensifier (Mercuric) with Sodium Sulphite, for Gelatine Dry-Plates.

Whiten the negative in the saturated solution of mercuric chloride, wash and blacken with a solution of sulphite of sodium 1 in 5. Wash well.

The reduction is perfect, with a positive black tone.

## Intensifier with Iodide of Mercury.

Dissolve 1 drachm of bichloride of mercury in 7 ounces of water and [illegible] drachms of iodide of potassium in 3 ounces of water, and pour the iodide solution into the mercury till the red precipitate formed is completely dissolved.

For use, dilute with water, flow over the negative till the proper density is reached, and wash, when the deposit will turn yellow. Remove the yellow color by flowing a 5 per cent. solution of hypo over the plate, and give it the final washing.

## Agfa Intensifier.

One part of Agfa solution in 9 parts water (10 per cent. solution). Immerse negative from 4 to 6 minutes.

## Reducer for Gelatine Dry-Plate Negatives (Farmer's).

| | |
|---|---|
| Sat. sol of ferricyanide of potassium.............. | 1 part |
| Hyposulphite of sodium solution, 1 in 10 ......... | 10 parts |

## Reducer for Gelatine Dry-Plates.

| | |
|---|---|
| Perchloride of iron.......... ...................... | 30 gr. |
| Citric acid ........................ ................. | 60 gr. |
| Water........ ............... .................... | 1 pint |

## Belitski's Acid Ferric-Oxalate Reducer for Gelatine Plates.

| | |
|---|---|
| Water.......................... ................. | 7 ounces |
| Potassium ferric oxalate.................. ... | 2½ drachms |
| Crystallized neutral sulphite of sodium .... | 2 drachms |
| Powdered oxalic acid, from.................. | 30 to 45 gr. |
| Hyposulphite of soda.............. ......... | 1½ ounces |

The solution must be made in this order, filtered, and be kept in tightly-closed bottles; and as under the influence of light the ferric salt is reduced to ferrous, the preparation must be kept in subdued light, in non-actinic glass bottles.

## Orthochromatic Dry-Plates — Erythrosine Bath (Mallman and Scolik).

Preliminary Bath.

| | |
|---|---|
| A.—Water.............................................. | 200 C.c. |
| Stronger ammonia.... .......................... | 2 C.c. |

Soak the plate for two minutes.

Color Bath.

| | |
|---|---|
| Erythrosine solution, 1 in 1000...................... | 25 C.c. |
| Stronger ammonia (0.900)............................ | 4 C.c. |
| Water.................................................. | 175 C.c. |

The plate should not remain longer in this bath than one and a quarter minutes.

THE WISE MAN
George T. Power

# PRINTING PROCESSES.

**Sensitizing Plain and Albumen Paper**.—The usual method of rendering paper of any kind sensitive to light is to float it for a varying length of time on a solution of silver nitrate, having previously salted it, if it be plain paper, with some chloride, usually chloride of ammonium. In practice it has been found that the strength of the silver bath should not fall below thirty grains of silver to the ounce of water, lest the albumen be dissolved; and that, save in exceptional cases, there is no need of a greater strength than sixty to sixty-five grains to the ounce. The precise strength necessary to produce the best results with any given brand of albumen paper depends upon the amount of chloride used in salting; a paper weak in chloride requiring a weak bath, while one rich in chloride demands a strong one.

**Formulæ for Sensitizing Bath.** For very Strong Negatives.

No. 1.

| | |
|---|---|
| Silver nitrate | 35 gr. |
| Water | 1 oz. |

Print in full sunlight.

For Thin Negatives.

No. 2.

| | |
|---|---|
| Silver nitrate | 80 gr. |
| Water | 1 oz. |

Print in the shade.

No. 3.

| | |
|---|---|
| Silver nitrate | 60 gr. |
| Ammonium nitrate | 60 gr. |
| Ammonia | 2 mms. |
| Water | 1 oz. |

For prints on plain, resinized, gelatinized paper and leatherized paper:

No. 4.

| | |
|---|---|
| Silver nitrate | 60 gr. |
| Gelatine | 5 gr. |
| Water | 1 oz. |

**C. W. Hearn's Formula.**

No. 5.

| | |
|---|---|
| Nitrate of silver | 40 gr. |
| Distilled water | 1 oz. |

To every twenty ounces of solution add one dram of saturated solution of carbonate of soda. The bath will at once assume a creamy color; allow the solution to settle, then decant and filter. Carbonate of silver will deposit in the bottle, and this will take the organic matter from the bath and prevent it from discoloring. Allow the carbonate to remain in the bath, pouring the solution back upon after using. Then shake well and the bath will soon be ready for use again.

Keep the bath up to its full strength and occasionally add a few drops of the carbonate of soda solution.

**Floating the Paper.**—There should be enough of the bath poured in to cover the bottom of the pan to a depth of at least half an inch, and it should have been most carefully freed from all impurities before the sensitizing is begun. Impurities and air-bubbles are the two great enemies of the sensitizing room. Grasp the paper by the two opposite corners, albumen side down, bring the hands together, and lower the convex side to the surface of the bath; separate the hands, and the paper will float on the surface. If it shows an obstinate tendency to curl up, gently breathe upon it. This difficulty may be overcome by placing the paper, the night before sensitizing, in a damp place. Now raise one corner and look for air-bubbles. If any are found, break them with the point of a glass rod, and again lower the paper. When it has floated the proper length of time, from one to three minutes being the usual time, raise it by one corner very slowly, until another corner is free, which is then grasped by the other hand and the paper slowly withdrawn, allowed to drain a minute into a dish, and hung up by one corner to dry in the dark, or yellow light.

**Points in Sensitizing.** 1. Have the paper damp before silvering.

2. Before floating ascertain the condition of the bath as to strength and alkalinity.

3. Do not allow the paper to become bone-dry before printing if you wish to have rich prints. Of course, it must be dry enough not to adhere to the negative; anything more than this is not only useless, but fatal to securing the best results.

**Toning Solution.** 1. Stock Solution.

A.

| | |
|---|---|
| Chloride of gold | 1 gr. |
| Water | 20 oz. |

B.

| | |
|---|---|
| Acetate of soda | 15 gr. |
| Water | 1 oz. |

C.

Saturated solution of sulphate of copper.

When solution is complete, add B to A, and add 10–15 drops of C, allow to stand at least 24 hours before using. Tone only until the half tones are somewhat bluish by reflected light.

This bath will keep.

**Tungstate of Soda Formula.**

| | |
|---|---|
| Chloride of gold | 1 gr. |
| Tungstate of soda | 20 gr. |
| Boiling water | 8 oz. |

Ready for use, as soon as cold. Keeps well.

**Phosphate of Soda Formula.** For Rich Purple Tones.

| | |
|---|---|
| Phosphate of soda | 20 gr. |
| Chloride of gold | 1 gr. |
| Water | 8 oz. |

Ready for instant use; but does not keep well.

**Platinum Bath Formula.**

| | |
|---|---|
| Bichloride of platinum solution | 30 drops. |
| Hypo | 3 gr. |
| Hydrochloric acid (C. P.) | 5 drops. |
| Water | 5 oz. |

The platinum solution is made by dissolving enough of the salt in one ounce of water to give it a rich, sherry color, a few grains will suffice. This bath is slow, but good. It should be warmed to 70 deg. Fahr., and the free silver should be well washed out of the prints.

### Borax Bath Formula.

| | |
|---|---|
| Chloride of gold | 1 gr. |
| Borax | 30 gr. |
| Boiling water | 8 oz. |

Ready for use when cooled down to 60 deg. Fahr. Gives rich brown tones, and keeps well. An excellent bath for ready-sensitized paper.

### For Sepia and Black Tones.

| | |
|---|---|
| Chloride of gold | 2 gr. |
| Sat sol. chloride lime | 2 drops. |
| Chalk (precipitated) | 3 gr. |
| Boiling water | 16 oz. |

The chloride of lime solution is made by shaking a teaspoonful of the chloride in a pint-bottle full of water. When the solids have settled, decant the clear portion, which should be kept in the dark.

Allow the bath to stand at least a day before using. It improves with age.

For sepia, tone but very little, just off the red; for a black, tone to a deep purple.

### Hearn's *Sal Soda* Formula.

| | |
|---|---|
| Distilled or ice water | 64 oz. |
| Acid sol. of chlo. of gold (4 grs. to 1 oz.) | 1 oz. |
| Saturated solution of sal soda | ½ oz. |

Should be prepared one-half hour before use.

### Hearn's Chloride of Lime Formula.

| | |
|---|---|
| Water | 40 oz. |
| Chloride of lime | 5 gr. |
| Chloride of gold | 4 gr. |

If the chloride of gold is acid, it may be neutralized with carbonate of lime.

For resinized, gelatinized, leatherized, and plain paper:

Stock Solution.

| | |
|---|---|
| Gold chloride | 15 gr. |
| Water | 7½ dr. |

To make the bath, add two drams of the gold solution neutralized with a pinch of chalk, to ten ounces of hot water. Place two drams of acetate of soda in a quart bottle, and filter the above solution into it; make the bulk up to twenty ounces. This bath can be used in a few hours, but it improves by keeping.

Fixing Bath.

| | |
|---|---|
| Hyposulphite of soda | 4 oz. |
| Water | 20 oz. |
| Ammonia | ½ dr. |

**Printing on Plain Paper.** Prepare the plain paper with

| | |
|---|---|
| Ammonium chloride | 60 to 80 gr. |
| Sodium citrate | 100 gr. |
| Sodium chloride | 20 to 30 gr. |
| Gelatine | 10 gr. |
| Distilled water | 10 oz. |

or,

| | |
|---|---|
| Ammonium chloride | 100 gr. |
| Gelatine | 10 gr. |
| Water | 10 oz. |

The gelatine is first swelled in cold water and then dissolved in hot water, and the remaining components of the formula are added. The solution is filtered, and when still warm the paper floated upon it for three minutes.

The salted paper is sensitized upon a neutral 45-grain silver bath.

### Platinum Toning Bath, for Plain Silver Prints.

| | |
|---|---|
| Chloroplatinite of potassium | 1 grm. |
| Water | 1 liter. |
| Nitric acid | 5 to 10 drops. |

### Toning Silver Prints After Fixing (Pizzighelli).

| | |
|---|---|
| Ammonium sulphocyanate | 300 grm. |
| Gold chloride | 3 grm. |
| Potassium hydrate | 3 grm. |
| Water | 1000 grm. |

## READY SENSITIZED PAPER.

### ARISTO PLATINO.

**Directions.**—The printing of Aristo Platino for platinum toning should be very deep, tinting the high-lights considerable. Pay no attention to bronzing in shadows, that will all tone out.

Prints should be washed through five changes of cold water.

When sufficiently washed and ready to tone, the prints are first placed in a plain gold-toning bath, made slightly alkaline with borax. The bath should contain sufficient gold to tone in from 5 to 8 minutes, and will work better if made up 2 or 3 hours before using. The toning should be carried in this bath to a medium purple. This is probably rather indefinite, but after one or two trials there will be no difficulty in determining the proper tone.

If the prints are not sufficiently toned in the gold bath, leaving the deeply printed parts quite red, it will be necessary to over-tone in the platinum bath to remove the red, and the result will be a green or olive black in the finished print. When the toning of gold bath has been carried to the right point, a pure black tone will be reached in platinum bath at about the same time that the last trace of warmth disappears. A little of the olive tone is not objectionable. On the contrary, it is rather pleasing.

After the gold toning, prints are given two changes of water and toned in a platinum bath made of Aristo Platinum solution, according to instructions on bottle.

The bath should be made up a couple of hours before using, and during cold weather, or at any time when the water used is quite cold should be slightly warmed to take the chill off. When the prints are first placed in the platinum bath, the tone changes to a deep purple or purple black, then to a pure black, and, if left in the bath too long, will have the green or olive black before referred to.

When a large number of prints are being toned at one time and a check bath is necessary, place the prints as they come from the platinum bath in water made slightly alkaline with carbonate of soda.

After the platinum toning give prints two more changes of water, and fix 10 minutes in a fresh fixing bath 18 hydrometer test.

Final wash, 1 to 1½ hours in running water. If a syphon washing tank is used, there should be a change of water at least every 5 minutes and the syphon should empty the tank completely each time.

Mount with plain starch paste and lay prints out on a drying rack to dry. If the weather is damp and drying is slow, a little fire in finishing room will be a good thing. When thoroughly dry, run prints through a cold burnisher to shape the mounts.

## ARISTO COLLODIO-CARBON

(For Black and White Tones.)

**Printing.**—Print until the high-lights are well tinted, about the same as you would print Aristo Platino. Too light printing gives weak and flat-looking prints when finished.

**Washing.**—Wash prints thoroughly in 8 changes of water, separating prints constantly in each water.

**Gold Bath.**

| | |
|---|---|
| Water | 64 oz. |
| Aristo Gold No. 2 | 1 drm. |
| Acetate of soda (saturated solution) | 1 oz. |
| Borax (saturated solution) enough to turn red litmus paper blue in one or two minutes. | |

This bath should be made up four or five hours before using. Add gold enough to keep speed of bath eight to ten minutes. Watch the bath closely to see that the high-lights do not bleach. If they show this, add more alkali, regardless the color of the litmus paper. Tone prints in this bath to a purple, but in no case tone as far as a blue. After toning place the prints in an acid stop water of 3 ounces Acetic Acid No. 8 to each gallon of water.

**Caution.**—If prints are toned too fast in gold bath they will be flat. The whites should be thoroughly cleared and brilliant when they come from the gold bath. Too much alkali will give flat prints and muddy whites.

**Washing after Gold Bath.**—Wash prints in 4 changes of clear water, handling prints over in each water to thoroughly eliminate any alkali from gold bath and free gold that may remain in the print. After prints are washed tone in the following bath :

**Platinum Bath.**

| | |
|---|---|
| Water | 54 oz. |
| Aristo platinum (full strength) | 3 drm. |

Tone in this bath until the whites are thoroughly cleared, and all trace of color is out of the deepest shadows. After prints are toned, wash through two changes of clear water; to the third water add 2 ounces saturated solution of borax (crystals) to the gallon. Handle the prints in this alkali solution for ten minutes, then wash carefully through three changes of clear water, and fix in the following bath :

**Fixing Bath.**—Hyposulphite of soda. 18 grain hydrometer test, or 2¼ ounces hypo crystal to 32 ounces of water. Fix fifteen minutes. Prints should be handled constantly to insure thorough fixing. After prints are fixed, place in salt bath, six ounces salt to one gallon of water, for five minutes, and then into washing water.

**Final Washing.**—Washing after fixing is much more important with Collodio-Carbon than with any other paper. Owing to the weight and thickness of the stock it should be carefully washed through sixteen changes of clear water, handling each print separately; then wash for one hour in running water and they are ready to mount or dry.

1. In washing Collodio-Carbon paper, plenty of water should be used in the trays. In the winter the chill should be taken off the water. Bath of good depth should always be used. Insufficient washing gives flat, muddy prints. Owing to the heavy stock on which the emulsion is coated, prints should have at least twice the number of wash waters before toning, between toning baths and hypo, and after hypo, as is required for platino prints.

2. Prints should tone in gold bath to thoroughly clear the whites,

and should not tone too fast, six to eight minutes being fast enough, as too fast toning gives flat prints. Too much alkali in the gold bath gives muddy prints and yellow whites; too little gives pink whites. Taking prints from gold bath too warm in color gives olive tones when dry. Toning too far gives blue blacks. A ripened gold bath will always give better results than a fresh one. Do not use an old gold bath.

3. If prints are not thoroughly washed between gold and platinum baths, and between platinum and hypo baths, it will cause muddy whites.

4. If prints show blue in platinum bath, and they have not been toned too far in the gold bath, reduce the speed of the platinum bath by adding water and warm the bath slightly. If they show too much olive, strengthen the platinum bath.

5. Should the whites show bleaching or cutting out in the hypo bath, add enough of the saturated solution of borax so that red litmus paper will turn blue in one minute.

6. Prints on Collodio-Carbon will dry a shade darker in tone, and should show a slight trace of olive in wash water for black tones when dry.

7. After prints are dry they can be straightened by damping slightly on back with a sponge and then putting under slight pressure until dry, when they may be trimmed and mounted.

## ARISTO PLATINO BACKING.

**For Backing Platino Photographs.**—This paper is made upon the same pure raw stock, and is coated with the same pure collodion emulsion, as used for Aristo Platino, except that it contains no silver.

The object of using Aristo Platino Backing paper is to make the finished prints lie perfectly flat. By squeegeeing the prints face down, upon glass, and mounting backing paper on to them, thus bringing the collodion emulsion to the *outside* of both print and backing, the finished picture draws both ways practically the same, and therefore cannot curl or cockle.

**Directions.**—After the prints have been finally washed, take them one by one from the final washing water, and squeegee, face down, on clean glass. Paste the backing paper instead of the print. Then mount the backing paper over the print on to the glass, being careful to rub it down smooth, rubbing it from the centre toward the margin.

The backing paper should be one inch larger than print, so that when it is mounted over the print on the glass it will leave a margin of half an inch all around the print where the backing paper adheres directly to the glass, thus holding the print in perfect contact with the glass until it is bone dry, when the print may be cut from the glass with a sharp knife and trimmed. The margin of backing paper which remains on the glass can be readily removed with hot water, and the glass made ready for another print. Each glass may be made to do double service by mounting a print as above described on each side, thus: Squeegee a wet print on to one side of the glass, turn it over and lay on a clean blotter, then squeegee a print on the other side. Mount backing paper over this print, then turn the glass over again and mount backing over the print on the other side, and place glass in a rack to dry.

If small prints—for instance, cabinet size—are being made, twelve prints can be squeegeed to one glass as follows: Take a 14 x 17 glass, perfectly clean on both sides, place six cabinet prints on one side close together, being careful not to allow any one print to overlap another. Squeegee, then turn the glass over with these prints on, laying on a clean blotter, and squeegee six prints on the other side. Then mount a piece of backing paper, 12 x 13 inches in size, over the whole six prints. This will allow at least half an inch margin of backing paper to adhere to the glass around the edges of the six prints. Then turn the glass over again and mount a piece of backing paper over the other six prints, and place the glass with the twelve prints mounted on it in a rack to dry.

**Notes.**—1. In preparing the backing paper it must be understood that the emulsion of this paper contains preserving acids which must be removed before use. It is therefore necessary to wash through four changes of water, about five minutes to each change. Then, in order to have this paper as thoroughly wet as the prints are when they are squeegeed, the backing paper should be allowed to soak during the toning and washing of the prints.

2. In cutting the backing paper care should be used to see that the grain of the paper in the backing runs the same way in the sheet as the grain of the paper in the print. This may be ascertained by cutting off a piece, say, two by three inches, and throwing into a tray of water. If it turns up at the sides the grain runs the long way; if it turns up at the ends the grain runs crosswise. In other words, see that the print and the backing curl the same way of the sheet. This is necessary in order to insure the print lying flat, for if the grain of the backing paper should run crosswise of the grain in the print, the finished print would curl slightly. Always cut the backing paper one inch larger than the print or set of prints it is to cover, so as to allow half an inch of margin that will adhere directly to the glass.

3. In squeegeeing prints the proper tool to use is a plain, flat, soft rubber squeegee, sold by all stock dealers at a nominal price. (A roller squeegee is not practical for this purpose.)

4. Care should be taken to see that all surplus water on the margin of glass around the edges of print or prints is carefully removed before mounting the backing paper to it. A drop of water carelessly left on the glass would interfere with the adhesion and cause the print to cockle at that point.

5. Prints should be allowed to dry slowly at first until the paste is thoroughly set, or until they are about half dry; then the drying may be hastened by artificial heat.

6. It has been found in squeegeeing several prints at a time, for instance, six cabinets on one glass, that occasionally paste may interfere with, possibly one out of the six prints coming from the glass freely. A preventative for this trouble can be found in the use of a little castile soap in the last water which the prints are put through. Take a piece of pure castile soap and swish it through the water a few times until the water feels smooth to the touch. Prints going from this water on to the squeegee glass will be sure to come off free.

## BECKER'S SEPIA FORMULA FOR COLLODIO-CARBON.

**Printing.**—Print about two shades lighter than desired for regular black and white toning, or until the high-lights are slightly tinted.

**Washing.**—Wash in four changes of clear water. In the fifth water add a handful of salt to say about two gallons of water. Allow the prints to remain in this water for from five to ten minutes, or until they become a decided yellow in the high-lights. Then wash in four changes of clear water, and tone in the following bath, to color desired when finished.

**Toning.**

Water ........................ ... ............... 128 oz.
Aristo Platinum No. 2 (full strength).............. 6 drm.

Prints should tone in from one and a half to two minutes' speed. If they tone slower add platinum.

**Washing after Toning.**— After prints are toned wash in four changes of clear water. In the second water after toning add a few drops of saturated solution of sal-soda. This kills the action of the acid from the platinum bath.

**Fixing.**—Fix prints in hypo bath, 18 hydrometer test, for twenty minutes. After fixing place the prints in salt water for ten minutes, then wash as usual.

**Notes.**—1. Pay no attention to bronzing of prints in the shadows, as this will disappear as soon as prints go into the platinum toning bath.

2. The salt used in the wash water before toning prevents the highlights from bleaching in the toning bath.

3. The platinum bath can be used over again by taking one-half old bath and half fresh water ; add enough platinum to bring speed of toning to five or eight minutes.

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## ARISTO GOLD PAPER.

**Directions.**

**Printing.**—Print Aristo Gold Paper about shade of finished print. The character of tone depends on depth of printing. Make a trial of two or three prints, printed to different depths, as a guide for the tone you most desire.

**Carbon Sepia Tones.**—Wash the prints thoroughly in six changes of water, separating prints in each wash by hand, and fix for 20 minutes in a hypo bath 30 grains strong, hydrometer test, which is equivalent to 4 ozs. hypo crystals to 32 ozs. water (4 ozs. hypo crystals, equal to 16 teaspoonfuls). After prints are fixed wash in 10 changes of water, separating prints constantly in each water for 5 minutes; after washing they are ready for mounting.

**Purple Tones.**

**Salt Bath.**—After printing place the prints, one at a time face down, into a tray containing 16 ounces of water to which has been added ¼ ounce of table salt. In this solution the prints should be kept in motion and thoroughly separated. Allow them to remain in this solution until they turn to a purple tint, after which rinse off in a tray of clear water containing a little sal-soda. Just enough sal-soda should be added to this water to make it feel smooth to the touch. Leave prints in this soda water two or three minutes, then remove them to

**Fixing Bath,** which should be made as follows:

Water............... ......................... 8 oz.
Hyposulphite of soda (crystals).................... 1 oz.

Allow the prints to remain in this bath 15 minutes, during which time they should be kept thoroughly separated by handling them over one by one.

**Washing.**—After the fixing wash prints through 10 changes of water, by hand, when they are ready to mount.

If prints are to be used unmounted, blot them off carefully, and place them between clean, dry blotters to dry. If kept flat until thoroughly dry they will always remain so.

## ARISTO GOLD POST CARD.

**Directions.**—Print until all detail is out or about the shade of the finished print.

Wash in six changes of water, separating the cards thoroughly in each water.

Fix for 20 minutes in hypo bath 30 grains strong, hydrometer test (or 4 ounces hypo crystals to 32 ounces water.

Wash one hour in running water or sixteen changes, by hand, separating the cards thoroughly in each water.

Dry between photographic blotters.

To flatten cards, proceed as follows: Take a piece of two-inch gas pipe two feet long and cover it with clean paper, pasting the paper to the pipe. Cut a strip of heavy, strong paper several yards long and two feet wide, roll same around pipe, after a couple of turns roll the cards in, face down, between paper and pipe; continue to roll until all cards are in, and let them stand for one hour. Should cards curl too much, reverse and put in roll for five or ten minutes.

## ARISTO, JR.

**Directions.**

**Printing.**—Print considerably darker than desired when finished. Good bold prints are made under two or three thicknesses of tissue, especially in cases of weak negatives.

**First Washings.**—In summer use water as runs from the tap, natural temperature. In winter use only enough warm water to give comfort to the hands.

It is important to wash free silver and preserving chemicals from paper before toning, but do so by rocking tray through five or six changes of water. Do not handle prints over; it is not necessary, and increases the chances of red spots or stains.

**Toning.**—Tone in the following bath: Water 60 ounces, No. 2 Aristo Gold 1 dram, or, if dry chloride of gold is used, 2 grains and ½ dram of dry acetate of soda. Add a few drops of saturated solution of borax, enough to make the bath slightly alkaline. Allow to stand two or three hours before using.

**For Dark Tones.**—This bath can be renewed two or three times by the addition of gold:

| | |
|---|---|
| Water | 32 oz. |
| Sulpho cyanide of ammonia | ½ oz. |
| No. 2 Aristo gold | 1 drm. |

Note.—If Aristo Gold is not available, use 3 grains of ordinary gold.

**Fixing.**—Fix in hypo bath 10 to 12 hydrometer test, or 1 ounce saturated solution hypo to every 16 or 18 ounces of water. Have plenty of bath to cover prints nicely, and separate thoroughly; 15 or 20 minutes will be sufficient time.

**Final Washing.**—Final wash thoroughly. It is the frequent and complete change of water that washes the hypo from a print, not continuous soaking. One hour in running water that changes completely every few minutes is sufficient, or seven or eight changes of water if prints are washed by hand.

## ARISTO SELF-TONING PAPER.

**Directions.**

**Printing.**—Print a very little darker than desired in finished print.

**Salt Bath.**—After printing place prints, one at a time face down, into a tray containing 16 ounces of water to which has been added ¼ ounce of table salt. In this solution the prints should be kept in motion and thoroughly separated. Allow them to remain in this solution until they turn to a purple tint, after which rinse off in a tray of clear water containing a little sal-soda. Just enough sal-soda should be added to this water to make it feel smooth to the touch. Leave prints in this soda water two or three minutes, then remove them to the

**Fixing Bath,** which should be made as follows:

| | |
|---|---|
| Water | 8 oz. |
| Hyposulphite of soda (crystals) | 1 oz. |

Allow the prints to remain in this bath 15 minutes, during which time they should be kept thoroughly separated by handling them over one by one.

**Note.**—Print Matt Self-Toning about shade of finished print.

**Washing.**—After the fixing, wash prints through 10 changes of water, by hand, when they are ready to mount.

## MONARCH MATTE.

**Printing.**—Being rich in silver it requires printing only to the point where the highest lights are slightly tinted; in other words, continue while the print is gaining in strength and brilliancy, and stop when print begins to lose. If you over-print the high-lights they will not clear up and you will get muddy half-tones. Remember this paper does not bleach and you do not allow for it.

**Washing.**—Wash prints in five or six changes of water, handling prints over each time. Wash until all traces of free silver have disappeared. To prevent red spots, caused invariably by grease or oil in the water, make first wash water slightly alkaline (one ounce saturated solution carbonate soda to each gallon water used). After handling prints over in this, wash in four or five changes of water. Where rain or soft water is used, the addition of the carbonate soda is unnecessary. Having the wash water at a temperature of from 65 degrees to 70 degrees is productive of best results.

**Gold Toning Bath.**—For the best results, the gold toning bath should be made up fresh each time, and about two hours before toning, as follows:

| | |
|---|---|
| Water | 60 oz. |
| Monarch gold solution | 1½ drm. |
| Salt | ¼ teaspoonful |

This bath should be made very slightly alkaline with borax for olive tones, with carbonate soda for warm black tones, with bicarbonate soda for purple-black tones. We recommend carbonate soda, same giving clearest shadows. Test your gold bath with red litmus, adding only enough of the alkali to turn the litmus a purple tint, *not enough to turn it a decided blue*, ten to fifteen drops of the alkali usually being sufficient. Too much alkali results in yellow whites and muddy shadows. Speed of gold bath should be from six to eight minutes, not faster. Tone to a medium purple

**Intermediate Washing.**—After gold bath wash prints in three or four changes of water, handling prints over each time. Under no consideration wash prints here in running water.

**Platinum Toning Bath.**—The platinum toning bath should also be made up fresh for each toning, and too, at least from one and one-half to two hours before toning, as follows:

| | |
|---|---|
| Water | 20 oz. |
| Monarch platinum solution | 1½ drm. |

This bath should tone in six minutes, slow toning in the platinum bath destroying the brilliancy of the prints. For rich black tones, tone prints in this bath, just until the red disappears from the shadows by transmitted light This bath should be kept at a temperature of 70 degrees, in cold weather 75 degrees.

Monarch Matte has more latitude in the platinum bath than any other collodion paper, and the tendency is to over-tone in this bath, thereby getting olive or brown tones instead of blacks.

N. B.—To those desiring to dissolve their own chloro platinite, we recommend their using E-A Platinite. Formula for use of same is furnished on application.

**Intermediate Washing.**—After platinum toning bath, prints should be washed in three or four changes of water, prints handled over each time. Where large batches of prints are toned, a check bath is recommended as follows: From platinum bath place prints into water made slightly alkaline with carbonate soda (one-half ounce saturated solution carbonate soda to the gallon of water.) After this wash the prints in three changes of water.

**Hypo Bath.**—The hypo bath should be 15 degrees hydrometer test, and prints fixed in same for fifteen minutes. For thorough fixing we advise the handling of the prints while in the hypo, (1½ ounces hypo to 30 ounces water.)

**Final Washing.**—If this is done by running water, one to one and one-half hours is sufficient, frequent handling of the prints however necessary. If washing is done in trays and by hand, at least fifteen changes of water are essential.

**Sepia Tones.**—Monarch Matte produces the most perfect sepia tones when handled as follows:

**Printing.**—Print only a shade deeper than the sepia tone desired, making no allowance for bleaching.

**Washing.**—Wash prints and handle through first wash water; to second wash water add four ounces of salt to each gallon of water, handle prints over in this salt bath for five minutes, after which wash through three changes of water and tone as follows:

| | |
|---|---|
| Water | 50 oz. |
| Monarch gold solution | 1 drm. |
| Salt | ½ teaspoonful. |

and to which add ten drops saturated solution carbonate soda. Tone prints so as to just clear the whites, taking prints directly from gold bath into

**Intermediate Wash.**—As follows: To every gallon of water used add six ounces of salt. From this place prints directly into hypo bath made as per the following:

**Hypo Bath.**—The hypo bath to be 12 degrees hydrometer test, and to each gallon of hypo bath add two ounces of salt. Fix prints in this bath from twelve to fifteen minutes.

**Final Washing.**—This to be as usual and according to instructions heretofore mentioned. N. B.—Do not be alarmed at the color of the prints in the hypo bath, they will dry down to a perfect sepia.

**Important.**—Too much care cannot be exercised in the use of proper chemicals and their purity. We therefore recommend the use of "E. A." Chemicals, E. A. Platinite and Monarch Solutions. These are at all times pure and of uniform strength.

## MONARCH GLACÉ.

Print a shade darker than print is desired, only slightly tinting the high lights. Change prints in subdued light. Wash thoroughly in slightly warm water, through five or six changes, or until the wash water shows no trace of silver.

**Make Gold Toning Bath as follows:**

| | |
|---|---|
| Water | 60 oz. |
| Monarch gold | 1 dr. |

Make slightly alkaline (Litmus test) with bicarbonate of soda for warm or purple tones.

With borax for brown tones;
With carbonate of soda for cherry tones.

Wash through two or three changes of water. Fix prints in a hypo bath of 8 hydrometer test for from 12 to 15 minutes. Wash prints after fixing in running water at least *one hour, or half an hour if washed by hand.*

## ACTINO MAT.

The printing should be carried deep enough to tint the whites. Pay no attention to the shadows. The preliminary washing must be very thorough, generally requiring from seven to ten changes.

The gold bath should be made up several hours before using. Use 1 grain of gold to 32 ounces of water, and add enough of a saturated solution of borax to turn red litmus paper blue in about three or four minutes. *Bath must be very slightly alkaline.* Prints should tone in the gold in about eight minutes.

Wash prints in several changes of water between the gold and platinum baths. *This is important.*

The platinum bath should be made up several hours before use, and should not be too cold. Use three to four drams of Columbian Platinum Solution to 32 ounces of water. Prints should tone in about the same time as required in the gold; not less than five minutes. Slow toning in the platinum give the best results.

Wash in two or three changes of water before fixing. Fix ten minutes in plain hypo bath of 18 hydrometer test.

## ROYAL PAPER.

The printing should be carried a few shades darker than the finished print is desired. Wash the prints in not less than six changes of clear water.

**Toning.** Stock Gold Solution.

| | |
|---|---|
| Water | 15 oz. |
| Chloride of Gold | 15 gr. |

To make up the toning bath, use one ounce of the gold solution to about thirty-six ounces of pure water. Test the solution with blue litmus paper for acidity and slowly add enough of a saturated solution of borax or bi-carbonate of soda (baking soda) until the bath turns the litmus paper blue. This should take about three minutes. Particular attention should be given to keeping the bath very slightly alkaline while in use; too much alkaline will give bluish tones in the whites and highlights, while insufficient alkali will cause the whites to assume a pink or old gold appearance. The prints should tone in about eight or ten minutes to secure the best results. If the bath tones slower, add more of the gold solution, and if too rapidly, more water should be added. For warm tones, tone the prints until the highlights are clear and the shadows are a cherry red. For purple or darker tones the operation should be carried somewhat further.

As soon as a print is toned transfer to clear water, and when the operation is finished give them one or two changes of clear water before fixing.

**Fixing.**—We recommend making up the hypo bath by hydrometer test, which should be about 18 degrees. By weight use one ounce of crystal hypo to 14 ounces of water. The prints should be fixed for about ten minutes. To prevent the softening of the film and blistering, especially during warm weather, the following hardener may be used:

**Hardener.**

| | |
|---|---|
| Hot Water | 64 oz. |
| Borax | 6 oz. |
| Sulphate of Soda | 8 oz. |
| Powdered Alum | 16 oz. |

Use 1 ounce of this solution to 16 ounces of fixing bath. During very warm weather the Hardener may be added to the first preliminary washing in about the same proportion.

After fixing, the prints should be washed very thoroughly.

Mount wet in the usual manner, burnish with hot burnisher, using hard castile soap for a lubricator.

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## NEPERA BROMIDE PAPER.

**Iron Oxalate Developer.**

Solution 1.

| | |
|---|---|
| Neutral oxalate of potash | 16 oz. |
| Hot water | 48 oz. |

Solution 2.

| | |
|---|---|
| Proto-sulphate of iron | 8 oz. |
| Hot Water | 24 oz. |
| Citric acid | 15 gr. |

Let both solutions cool off before use, and put them in separate bottles, where they will keep for months in good condition. The iron solution should be kept well corked, and should not be used if not perfectly clear and green.

Immediately before use measure off 4 volumes of Solution 1, and pour 1 volume of Solution 2 into it while stirring. (Do not pour Solution 1 into Solution 2, as it will not give a clear solution.)

We do not recommend any bromide of potassium as restrainer; would advise, however, for the same purpose, the addition of one-fifth or more of old *but clear* developer, which acts as an effective restrainer, gives better blacks, and allows the image to appear gradually. It is always better to start development with a weak developer containing some old developer, and afterwards, when the image has begun to appear, fresh developer can be added in required quantity; and finally, if necessary for bringing out the last details, an entirely fresh developer can be used. If you have no old developer, then add one or two drops of a 10 per cent. potassium bromide solution for every 2 ounces of developer.

Development should be carried out in the proper time. Too quick development will give greenish blacks and flat prints; too slow development may produce yellowish whites.

### Clearing Solution.

| | |
|---|---|
| Acetic acid, No. 8 | about 1 dr. |
| Water | 1 qt. |

This clearing solution should be flowed over and under the print, and the tray rocked for about a minute; then pour off, and the same operation should be repeated at least twice, taking care to wash the back as well as the face of print (which will prevent the iron in the developer from precipitating on the print.) The print is then to be rinsed in four changes of fresh water, and submerged in the hypo solution contained in a separate tray, for at least 15 minutes or longer.

### Metol-Quinol Developer.

| | | | | |
|---|---|---|---|---|
| Water | 750 | parts | or | 24 oz. |
| Metol | 1 | “ | “ | 15 gr. |
| Sodium sulphite (crystals) | 40 | “ | “ | 1¼ oz. |
| Hydroquinone | 4 | “ | “ | 1 dr. |
| Potassium bromide | ¼ | “ | “ | 4 gr. |
| Potassium carbonate | 20 | “ | “ | 5 dr. |

(or carbonate of sodium anhydrous 40 parts or 1¼ ounces.)

Dissolve the chemicals in the order indicated in the formula. This stock solution will keep indefinitely in well stoppered bottles filled to the neck. For use, dilute a sufficient quantity with an equal volume of water. This diluted developer can be used over and over again until it becomes discolored or works too slowly. In the latter case, some fresh developer may be added to it. Be careful not to mix any iron developer with this one, and use clean bottles and trays.

For very soft effects leave out the hydroquinone and double the metol in above formula. Any desired degree of softness or contrast can be obtained by altering the relative proportions of metol and hydroquinone in above formula.

**Hopo-Acid Fixing Bath.** Dissolve

| | |
|---|---|
| Hypo | 16 oz. |
| Water | 64 oz. |
| Alum | 1 oz. |

Allow to settle, decant, and use the clear solution. Keep this solution acid. If necessary, add occasionally a few drops of acetic acid.

An acid fixing bath hardens the film, prevents yellow stains, and does not discolor. If the bath should become alkaline, add a few drops of acetic acid.

After fixing wash as usual.

## MONOX BROMIDE PAPER

### Amidol Developer.

| | Avoirdupois. | Metric. |
|---|---|---|
| Amidol | 60 gr. | 4 grm. |
| Sulphite soda crystals | 1 oz. or hydrometer test 14 or one-half the amount of dry powder. | 30 grm. |
| Water | 24 oz | 750 grm. |

To every 8 oz. Ready Developer add 10 minims of a 10 per cent. solution of bromide of potash. For very strong negatives the bromide of potassium should be omitted, and the developer weakened by increasing the amount of water. For soft, weak negatives the quantity of bromide of potassium may be doubled.

### Metol Quinol Developer.

| | | | |
|---|---|---|---|
| Water | 30 oz. | Sodium sulphite crystals, or one-half the amount of dry powder. | 1½ oz. |
| Metol | 20 gr. | | |
| Hydroquinol | 90 gr. | | |
| Sodium carbonate crystals or one-half the amount of dry powder. | | | 2½ oz. |

When mixed, add 1 drachm of 10 per cent. solution of bromide of potassium.

## P. M. C. BROMIDE PAPER.

Developer:

| | Avoirdupois. | Metric. |
|---|---|---|
| Amidol | 60 gr. | 4 grm. |
| Sulphite soda, gran. | 1 oz.; or hydrome'r test, 14 | 30 grm. |
| Water | 32 oz | 1000 grm. |

## CYKO PAPER.

Cyko, being a developing-out paper, may be printed in a few seconds by any light.

The Welsbach gaslight will probably afford the most satisfaction, owing to its high illuminating power and steadiness. Daylight may be used, but as it varies constantly, artificial light is preferable.

### Formula for Developer.

Formula No. 1.

| | |
|---|---|
| Water, soft or distilled | 32 oz. |
| Metol | 15 gr. |
| Sodium sulphite (dried, powdered) | 1 oz. |
| Hydroquinone | 60 gr. |
| Sodium carbonate (granular) | ¾ oz. |
| Potassium bromide | 3 gr. |

Dissolve the chemicals in the order named, and remember that, while the above amount of bromide is usually sufficient, it may at times be found that more of the bromide solution must be added in order to produce clear whites, owing to the chemical composition of the water used.

These chemicals will dissolve in cold water, but much more readily in warm water; if warm water be used, the solution should be allowed to cool before using, about 70° F. being the proper temperature.

The above developer is suited for the contrast grades of Cyko; for normal Cykos it should be diluted with an equal quantity of water, and for soft Cykos more water than for the normal may be desirable. It is also excellent for negatives if diluted with two parts of water.

Professional photographers using developer in large quantity will find the following formula well suited to their use, especially when manipulating studio Cyko.

### Formula No. 2, for Stock Developer.

| | |
|---|---|
| Warm water (soft or distilled) 1 gallon | 128 ozs. |
| Metol | ½ oz. |
| Sodium sulphite (dried. powdered) | 16 ozs. |
| Hydroquinone | 2 ozs. |
| Sodium carbonate (granular) | 12 ozs. |
| Potassium bromide (crystals) | 1 dram. |

Mix in order named. Keep in well-stoppered bottles.

### For Contrast Cykos.*

| | |
|---|---|
| Stock developer | 1 oz. |
| Water | 3 oz. |

### For Normal Cykos.*

| | |
|---|---|
| Stock developer | 1 oz. |
| Water | 5 oz. |

### For Soft Cykos *

| | |
|---|---|
| Stock developer | 1 oz. |
| Water | 6 oz. |

* Note.—The addition of a few drops of bromide of potassium (10 per cent. solution) may be necessary to clear the whites.

For those preferring to use other developers, the following formulæ are given:

### Formula No. 3, Amidol.—Stock Solution:

| | |
|---|---|
| Amidol | 60 gr. |
| Sodium sulphite (dried, powdered) | ½ oz. |
| Water | 10 oz. |

For use, take stock 1 ounce, water 3 ounces, bromide 5 drops 10 per cent. solution.

This is a simple and economical developer, giving blue-black tones, but oxidizes sooner than metol.

### Formula No. 4, Edinol:

| | |
|---|---|
| Edinol | 15 gr. |
| Acetone sulphite | 75 gr. |
| Sodium carbonate (dry) | 113 gr. |
| Water | 3⅓ oz. |

1 drop 10 per cent. solution bromide of potassium.

Edinol and Amidol are free from the irritating influence on very absorptive skin sometimes caused by metol.

### Fixing Bath.

| | |
|---|---|
| Hypo | 12 oz. |
| Water | 64 oz. |

Dissolve, and then add

| | |
|---|---|
| Water | 5 oz. |
| Sodium sulphite (powdered) | ½ oz. |
| Acetic acid, No. 8 | 3 oz. |
| Alum (powdered) | ½ oz. |

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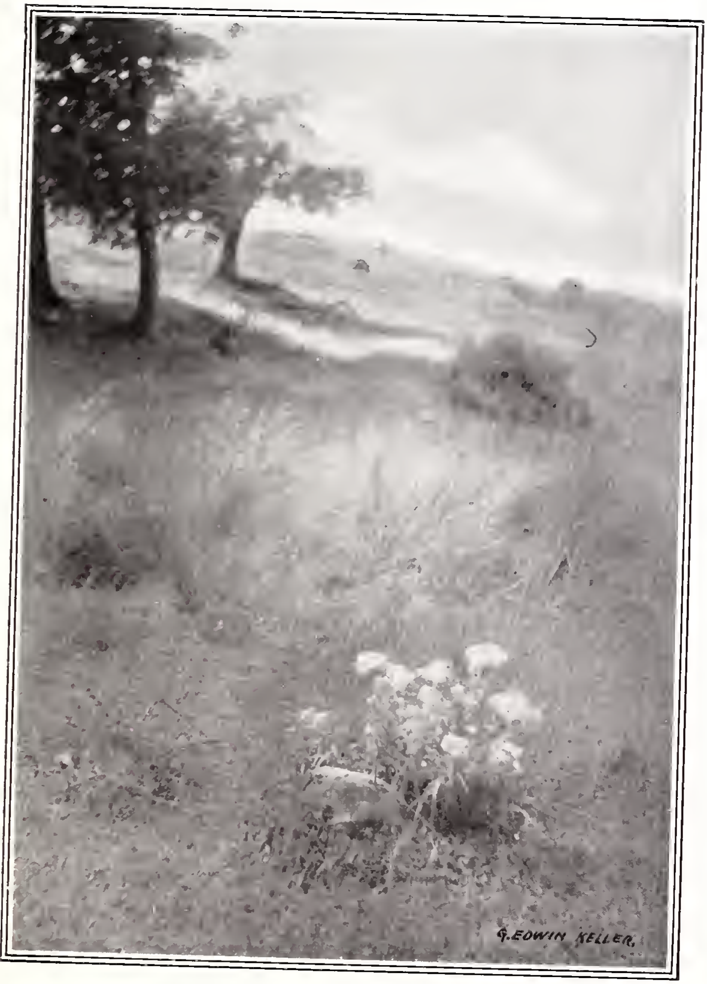
## VELOX.

**Developer** (dissolve chemicals in the order named).

| | |
|---|---|
| Water | 10 oz. |
| Metol | 7 gr. |
| Hydroquinone | 30 gr. |
| Sulphite soda (desiccated) | 110 gr. |
| Carbonate soda (desiccated) | 200 gr. |
| 10 per cent. solution bromide potassium | 40 drops |

This solution will keep indefinitely if placed in bottles filled to the neck and tightly corked.

It should be used full strength for "Regular," but can be diluted with equal parts of water when Special Velox is developed.



SUNNY HILL-SIDE

G. Edwin Keller

**Acid Fixing Bath** (dissolve chemicals in the order named).

| | |
|---|---|
| Water | 64 oz. |
| Hyposulphite of soda | 16 oz. |

After the above bath has been made, add to it 4 ounces Velox Liquid Hardener or the following hardening solution:

| | |
|---|---|
| Water | 5 oz. |
| Sulphite soda (desiccated) | ¼ oz. |
| Acetic acid (containing 25 per cent pure acid) | 3 oz. |
| Powdered alum | ½ oz. |

This solution can be used repeatedly and one pint of it will fix at at least one-half gross 4 x 5 prints.

If sulphite and carbonate sodas in crystal form are substituted for desiccated, double the quantities mentioned should be used. (Note—In England, Canada or wherever the British Pharmacopœia is official, use 150 grains instead of 200 grains of desiccated sodium carbonate.)

**Directions.**—Prepare developer and acid fixing bath, mixing solutions according to directions. Temperature of the developer should be about 72° Fahr.

Select a safe place for opening packages of paper and developing the prints. In a room illuminated only by a gas flame, or light of equivalent strength, these operations can be carried on with safety at ten feet from the burner. Be careful, however, that the *direct* rays of light do not reach the sheets of unexposed paper.

Provide three trays and in one have the developer, in another water, and in the third the fixing bath.

Fill the printing frame, placing the sensitive side of the sheet of Velox against the film side of the negative. The paper curls slightly, the sensitive side being concave ; an absolute test is to bite the corner of the sheet; the sensitive side will adhere to the teeth.

1. Expose by placing the frame a few inches from the artificial light used, even exposure being insured by having the frame away from the burner a distance equal to the diagonal of the negative. While exposure by diffused daylight from a northern window will insure good results with practice, *the use of artificial light is advised.*

A few seconds will be long enough for printing the average negative when Special Velox is used ; Regular Velox will need four or five times as much exposure as Special Velox, if in using both brands, printing frame is held at the same distance from the light. Exposure, with various artificial lights, at the distance advised when negatives of average density are to be printed, will be approximately as follows :

| | Size of Negative. | Distance from light | Welsbach burner | 32 c. p. electric or 6 ft. gas burner. | 16 c. p. electric or 4 ft. gas burner. | Average oil lamp |
|---|---|---|---|---|---|---|
| Special Velox | 4 x 5 or smaller | 7 inches | 10 sec. | 20 sec. | 30 sec. | 40 sec. |
| Regular Velox | 4 x 5 or smaller | 7 inches | 40 sec. | 80 sec. | 2 min. | 3 min. |

2. Immerse the print face up in developer, being sure that it is quickly and evenly covered by the solution. Regular Velox should be developed about fifteen seconds, while Special should be in the bath nearly twice as long. If the high-lights of the prints are gray, add a few drops of 10% solution bromide potassium to the developer. Do not use more bromide than is necessary to secure pure whites, as with an excess of restrainer the shadows will have a greenish tint.

3. Dip in water for a second to remove the greater part of the developer.

4. Immediately transfer to the acid fixing bath, where a thorough immersion should be secured to prevent stain (caused by uneven fix-

ing; fifteen minutes or longer should be the time of fixing. A print which flashes up in the developer and gets too dark before it can be conveniently removed from the developing tray, is very much over-exposed, and the time of exposure should be decreased, while inability to obtain a proper print in the time advised for development, indicates that the time of exposure should be increased.

Wash the prints in running water for an hour, or ten changes of water, each change being obtained by passing the prints, one at a time, from one tray of water to another, refilling each tray with fresh water whenever all the prints have been removed from it.

Dry the prints, face down, on cheese cloth or other absorbent fabric, so that they will not curl. The prints should be trimmed as desired, mounting with any good photographic paste. Glossy or Special Glossy Velox can be burnished or squeegeed. In the latter process wet prints should be placed face down, or a ferreotype tin, rolled into absolute contact and allowed to become bone dry, when they will peel off with the desired luster.

## DEKKO PAPER.

**Developers.**

### Metol-Hydrochinon.

| | |
|---|---|
| Metol | 7½ gr. |
| Hydrochinon | 30 gr. |
| Sulphite of soda (crystals) | 218 gr. |
| Carbonate of sodium (crystals) | 163 gr. |
| Water | 12 oz. |

Dissolve and add about 25 drops of a solution composed of bromide of potassium ½ oz., water 5 oz. This solution is to be used without diluting.

### Amidol.

| | |
|---|---|
| Amidol | 80 gr. |
| Sulphite of soda (crystals) | 200 gr. |
| Water | 10 oz. |

For use, take 1½ oz. of above stock solution, 3 oz. of water, and add 3 to 5 drops of bromide of potassium solution made of bromide of potassium ½ oz., water 5 oz.

## ARGO.

To Develop: After exposing, immerse print in developing solution, made as per formula.

**Metol Quinol Developer.**

| | |
|---|---|
| Water | 10 oz. |
| Metol | 7 gr. |
| Sodium sulphite (dry powder)<br>or crystals double the quantity. | 120 gr. |
| Hydroquinone | 30 gr. |
| Sodium carbonate (dry powder)<br>or crystals double the quantity. | 200 gr. |

When mixed, add to the above 15 to 25 drops of a bromide potassium solution composed of

| | |
|---|---|
| Bromide of potassium | 1 oz. |
| Water | 10 oz. |

**Amidol Developer.**

| | |
|---|---|
| Amidol | 20 gr. |
| Sulphite soda (crystals)<br>or dry, in the form of powder, half the amount. | 160 gr. |
| Water | 8 oz. |

When mixed, add to above 5 to 10 drops of bromide of potassium solution composed of

| | |
|---|---|
| Bromide of potassium | 1 oz. |
| Water | 10 oz. |

## ROTOGRAPH.

### Developer for Rotograph and Rotox Paper.

| | |
|---|---|
| Water | 150 oz. |
| Sulphite of soda | 6 oz. |
| Metol | 150 gr. |
| Hydro | ½ oz. |
| Carbonate of soda | 4 oz. |
| Bromide of potassium | 20 gr. |

The following is a good sepia formula—make the following stock solutions :

A.

| | |
|---|---|
| Water | 12 oz. |
| Ferri cyanide of potassium | 1 oz. |

B.

| | |
|---|---|
| Water | 12 oz. |
| Bromide of potassium | 1 oz. |

(Keep out of strong light.)

C.

| | |
|---|---|
| Water | 12 oz. |
| Sulphide of sodium | ½ oz. |

Take 1 ounce of solution A, 1 ounce of solution B, and 4 ounces of water. Place this in a dish and add 3 drops of pure water ammonia. In another dish put 1 ounce of solution C and 3 ounces of water. Place a tuft of cotton in each dish.

Moisten the black print which is to be made sepia, and place it face upwards on a glass, and go over the print with cotton dipped in the first solution until the print is entirely bleached out as far as possible, in other words until it has almost disappeared. The print must now be washed at least one minute in running water.

Next go over the print rapidly with cotton which has been dipped in second solution until there is an even sepia tone over entire print. Wash print in running water at least thirty minutes. Permanency can only be obtained by this thorough washing. Be sure that sulphide of sodium is used and not sulphite.

### Formula for Cleaning Whites in Bromide Paper.

| | |
|---|---|
| Iodine | 60 gr. |
| Potassium cyanide | 60 gr. |
| Iodide | 120 gr. |
| Water | 10 oz. |

Take three or four drops of stock solution, add to two ounces of water, swab with cotton the whites or whole print.

## AZO PAPER.

### Metol Hydrochinon Formula.

| | |
|---|---|
| Metol | 5 gr. |
| Hydrochinon | 20 gr. |
| Sulphite of soda | 145 gr. |
| Carbonate of sodium | 108 gr. |
| Water | 8 oz. |

Dissolve and add about 16 drops of a solution composed of bromide of potassium ½ oz., water 5 oz. This solution is to be used without diluting.

### Amidol Formula.

| | |
|---|---|
| Amidol | 64 gr. |
| Sulphite of soda (crystals) | 160 gr. |
| Water | 8 oz. |

For use, take 1½ oz. of above stock solution, 3 oz. of water, and add 2 to 4 drops of bromide of potassium solution made of bromide of potassium ½ oz. water 5 oz.

## LUMIÈRE CITRATE P. O. P.

**Exposure.**—Prints losing depth by toning, printing must be carried further than necessary for intensity desired. Examination of the prints should be made by diffused daylight or lamplight only, Do not expose printing frame out of a window when raining, damp being liable to cause the paper to adhere to the negative and injure it.

The value of a negative has a considerable influence on that of the print. Prints tone better and give the most fresh and clear tints when negative is correctly timed and sharp without too much contrasts.

**Toning.**—First wash prints a few minutes in running water.

In hot weather this washing must be preceded by one minute's immersion in a 3 per cent. alum solution, or, better still, in a 1 per cent. solution of Lumière's Formolene.

Any of the ordinary toning and fixing baths may be used with Lumière's Citrate P. O. P. The following combined toning and fixing formula gives the best results as to vigor, brilliancy and permanency :

A.

| | | | |
|---|---|---|---|
| Boiling water | to 1000 grms. or parts | | 30 oz. |
| Hyposulphite of soda | 250 " | " | 8 oz. |
| Alum | 15 " | " | ½ oz. |
| Lead acetate | 2 " | " | 30 gr. |

First dissolve hyposulphite of soda and alum in boiling water, filter, and after cooling add lead acetate previously dissolved in a little distilled water.

B.

| | | | |
|---|---|---|---|
| Distilled water | 100 grms. or parts | | 3 oz. |
| Chloride of gold | 1 " | " | 15 gr. |

For use take

| | |
|---|---|
| A—100 c. c. | 3 oz. |
| B— 6 c. c. | 80 min. |

This bath is prepared 24 hours before use. To clear same, add a small quantity of kaolin, shake and filter. It is recommended to expose this bath to daylight some hours before use.

Any modification in this formula is liable to injure the print.

The preparation of this bath being somewhat delicate, a solution of Lumière's Combined Toning and Fixing Powder may be advantageously substituted.

For those who prefer the separate baths we give the following formula :

| | | | |
|---|---|---|---|
| Distilled water | to 1000 grms. or parts | | 30 oz. |
| Refined chalk | 80 " | " | 2½ oz. |
| 1 per cent. sol. gold chloride. | 100 c. c. | " | 3 oz. |

It is essential to prepare this bath but a few days beforehand, its strength decreasing gradually.

Allow to stand for 24 hours, then filter and use as a stock solution 15 parts of solution for 100 parts of water, or 1 ounce of solution for 7 ounces of water.

Before toning, prints should be washed as directed above, then immerse one by one in the toning bath.

When toned wash rapidly and transfer in the following :

| | | | |
|---|---|---|---|
| Water | to 1000 grms. or parts | | 32 oz. |
| Hyposulphite soda | 200 " | " | 7 oz. |
| Alum | 3 " | " | 45 gr. |
| 1 per cent. sol. of lead acetate. | 15 c. c. | " | ¼ oz. |

The alum may be substituted by 10 grammes or 150 grains of Lumière's Formolene.

First dissolve hyposulphite of soda and alum in boiling water, filter and, after cooling, add lead acetate previously dissolved in a little distilled water.

Renew this solution frequently.

**Caution.**—In order to avoid stains immerse prints one by one in the bath; remove air bubbles with a tuft of cotton wool, gently rock the dish during; toning use a large porcelain dish in preference.

Toning bath must be abundant and at 65 degrees to 70 degrees F. Toning is complete in about 10 minutes. Take the prints out as soon as half tones have attained desired value, otherwise they would appear corroded, as is often the case with exhausted baths.

Not more than three 5 x 7 prints are to be toned in every ounce of fresh solution.

**Borax and Gold Toning.**—Beautiful violet tones may be obtained by treating Lumière's Citrate P. O. P., previously to combined toning and fixing, with the following borax and gold toning :

| | | | |
|---|---|---|---|
| Water | 1000 c. c. | or parts | 40 oz. |
| Borax | 10 grms. | " | ½ oz. |
| 1 per cent. sol. chloride of gold | 25 c. c. | " | 1 oz. |

Add chloride of gold just at time of use.

**Platinum Toning.**—A great variety of tones may be obtained with Lumière's Citrate Matt, by using the following bath :

| | | | |
|---|---|---|---|
| Water | 500 grms. | or parts | 16 oz. |
| Sodium chloride | 2 " | " | 30 gr. |
| Potassium chloroplatinite | 1 c. c. | " | 15 gr. |

Carry printing much further than desired intensity. Immerse the prints after previous washing in the above bath, in which they remain till black tone is attained, they must then be washed rapidly and fixed in the combined toning and fixing bath.

Tones vary with the length of time the prints are immersed in the platinum bath.

## LUMIÈRE BROMIDE PAPERS.

**Developer.**

Lumière's Diamidophenol (1) :

| | | | |
|---|---|---|---|
| Water | 1000 grms. | or parts | 32 oz. |
| Anhydr. sodium sulphite | 15 " | " | ½ oz. |
| Diamidophenol | 5 " | " | 75 gr. |
| 10 p. ct. sol. potassium bromide. | 2 c. c. | " | 30 min. |

(2) Anhydrous sodium sulphite may be substituted by twice as much sodium sulphite in crystals.

The relative proportion of sulphite and diamidophenol may be measured in volume by using 1½ parts of sulphite for 1 of diamidophenol.

A stock solution of sulphite may also be advantageously used, but it retains its strength only for a week; beyond that time its strength decreases gradually without any apparent change.

The following formula will be found to give good results :

| | | | |
|---|---|---|---|
| Water | 1000 grms. | or parts | 32 oz. |
| Anhydrous sodium sulphite | 15 " | " | ½ oz. |
| 10 per c. sol. potassium bromide | 2 c. c. | | 30 min. |

For every ounce of the stock solution add at the time of use 2½ grains of diamidophenol.

This solution is best prepared just before use.

**Fixing** takes place by five minutes' immersion in the following:

| | | |
|---|---|---|
| Water | 1000 grms. or parts | 30 oz. |
| Hyposulphite of soda | 200 " " | 6 oz. |
| Sodium bisulphite | 100 " " | 3 oz. |
| Alum | 2 " " | 30 gr. |

or preferably:

| | | |
|---|---|---|
| Water | 1000 grms. or parts | 30 oz. |
| Lumière's fixing salt | 1 package. | |
| Lumière's formolene | 10 grms. or parts | 150 gr. |

This bath may be used for a long time.

## SOLIO PAPER.

### Combined Toning Bath.

Stock Solution A.

| | |
|---|---|
| Hyposulphite of soda | 8 oz. |
| Alum (crystals) | 6 oz. |
| Sugar (granulated) | 2 oz. |
| Water | 80 oz. |

Dissolve above in cold water, and, when dissolved, add Borax, 2 oz.; dissolved in hot water, 8 oz.

Let stand over night, and decant clear liquid.

Stock Solution B.

| | |
|---|---|
| Pure chloride of gold | 7½ gr. |
| Acetate of lead (sugar of lead) | 64 gr. |
| Water | 8 oz. |

Solution B. should be shaken up before using, and not filtered.

To tone 15 cabinets, take

| | |
|---|---|
| Stock Solution A | 8 oz. |
| Stock Solution B | 1 oz. |

Place prints in the above without previous washing.

Tone to desired color, and immerse prints for five minutes in following salt solution to stop the toning:

| | |
|---|---|
| Salt | 1 oz. |
| Water | 32 oz. |

The extra fixing bath should be used to ensure *thorough fixing*.

After the salt bath, give one change of cold water, and fix for ten minutes in the

### Extra Fixing Bath.

| | |
|---|---|
| Hyposulphite of soda | 1 oz. |
| Sulphite of soda (crystals) | 60 gr. |
| Borax | ¼ oz. |
| Water | 20 oz. |

Wash 1 hour in running cold water, or in 16 changes of cold water, when prints may be mounted same as albumen prints.

The combined bath must be used cold, not above 50° Fahr. This condition can be obtained by placing a piece of ice in the bath when toning. If the bath is too warm, it will cause yellow prints with a greenish cast in the half-tones.

## ALBUMA PAPER.

### Combined Toning and Fixing Bath.

| | |
|---|---|
| Hot water | 66 oz. |
| Hypo. | 16 oz. |
| Sulpho-cyanide ammonia | 2 oz. |
| Acetate lead | ⅛ oz. |
| Nitrate lead | ½ oz. |
| Citric acid | ½ oz. |
| Chloride of gold (in solution) | 4 gr. |

### Separate Bath Formula.

Print—To good strength same as albumen paper.

Wash in eight or ten changes of water, or until all the free silver is removed.

### Toning Bath.

Stock Solution A

| | |
|---|---|
| Water | 15 oz. |
| Chloride of gold | 15 gr. |

Stock Solution B

| | |
|---|---|
| Water | 2 oz. |
| Acetate soda | 1 oz. |

To tone, take

| | |
|---|---|
| Water | 32 oz. |
| Stock Solution A | 1 oz. |
| Stock Solution B | ⅛ oz. |

Keep bath slightly alkali with bi-carbonate of soda. Test with litmus paper.

Mix one hour or more before using. Should tone in ten minutes. If bath tones quicker, add water; if slower, more gold. Best results are obtained by using half old and half new bath.

Transfer to runnning water, or wash in two or three changes of water.

Fix for ten minutes in

| | |
|---|---|
| Hypo | 4 oz. |
| Water | 64 oz. |

## KRESKO PAPER.

**Separate Bath Formula.**—Wash in 5 or 6 changes of water, or sufficient to remove the free silver.

Tone in a plain gold bath, using about 1 grain of gold to 48 ounces of water. Neutralize by adding a saturated solution of borax, bi-carbonate of soda or sal soda.

When toned, immerse prints in running water, where they may remain until all are ready for the fixing.

## DIRECTIONS FOR WORKING DISCO GLOSS.

Tone prints in the following bath, moving them while toning:

| | |
|---|---|
| Water | 40 oz. |
| Chloride of gold | 1 gr. |

Add a sufficient quantity of borax to turn red litmus paper blue. Tone prints to the desired shade and stop, as they will not change in fixing bath.

Fixing bath prepared as follows:

| | |
|---|---|
| Water | 48 oz. |
| Hypo | 2 oz. |

About fifteen minutes in this bath is sufficient. Keep prints separated.

This is a hardened paper, and can be toned in warm water in cold weather. Requires no ice, alum or hardening solutions of any kind.

**Combined Toning and Fixing Bath.**

To Print: The paper should not be printed quite as dark as albumen.

For blue-black tones print darker than for warm brown.

Do not fume or keep paper near ammonia.

In toning place only a few prints in the bath at a time, using bath enough to cover well the prints, place them in face up, and see that the air bells are removed.

**Borax Bath.**

Stock Solution No. 1.

| | |
|---|---|
| Hot water, 160° F | 64 oz. |
| Hypo | 8 oz. |
| Pulverized alum | 4 oz. |
| Borax pulverized | 2 oz. |
| Salt (com.) | 1 oz. |

Stock Solution No. 2.

| | |
|---|---|
| Water | 15 oz. |
| Chloride of gold | 15 gr. |

Place all the chemicals in a stone crock and pour the hot water on them, and stir until dissolved; let it cool, clear and decant.

Dissolve ½ oz. of acetate of lead in 8 oz. of water, and add 1½ oz. of it to No. 1 after cooling.

The hot water ripens bath faster. When cold water is used, the bath should stand for twenty-four hours or more to ripen.

To Tone: Add 1 oz. No. 2 to each 8 oz. of No. 1 used.

The above will tone about fifty cabinet prints; then discard and make up as at first. Tone prints to desired shade, then place in the following bath from three to five minutes, which will clear them perfectly and insure fixing.

## FOR TONING KLORO, SPECIAL AND KELAT PAPERS.

Toning Bath.

| | |
|---|---|
| Water | 60 oz. |
| Chloride of gold | 2 gr. |

Neutralize with a saturated solution composed of acetate soda and borax, equal parts. Test with red litmus paper, getting the bath as near neutral as possible.

Prints should tone in from five to ten minutes; too slow toning produces results which lack brilliancy.

If cold tones are desired, the bath should be made sufficiently strong to tone in from three to four minutes.

When prints have reached the desired tone, place them in large tray containing plenty of clear water, and fix twenty minutes in

Fixing Bath:

| | |
|---|---|
| Water | 40 oz. |
| Hyposulphite of soda | 2 oz. |

STUDY OF POLLARD WILLOWS

**W. H. Porterfield**

## EASTMAN'S PLATINUM PAPER.

**Developer.**

| | |
|---|---|
| Oxalate potassium, c. p. | 2 oz. |
| Phosphate potassium, c. p. | 1 oz. |
| Hot water | 19 oz. |

Allow the developer to cool, and use at a temperature of not less than 65 degrees, nor more than 75 degrees Fahr.

**Clearing Solution.**

| | |
|---|---|
| Muriatic acid, c. p. | ¼ oz. |
| Water | 15 oz. |

## "WATER TONE" PLATINUM PAPER.

"Water Tone" Platinum Paper is very easily affected by moisture; it will, therefore, be noticed when printing in warm, damp weather that the print will show quite a tendency to print out black in the deep shadows. This must not be taken into consideration, as the same amount of exposure is necessary as in dry days.

Print by direct light (sunlight preferred) until the shadows are clearly outlined *in a deep canary color.* At this stage the same detail will be observed in the half tones that the finished print will show. For developing, use plain water, heated to 120 degrees (which will be as hot as they can bear).

The development will be practically instantaneous, and care must be taken to avoid air bubbles forming upon the surface of the prints. Place prints, after developing, directly into a clearing bath of muriatic acid, one dram to twelve ounces of water, and let them remain in this bath about ten minutes, when they are ready for the final washing of fifteen minutes in running water, or five changes of about three minutes each. Lay out between blotters to dry and mount by attaching the corners.

## BRADLEY PLATINUM PAPER.

**Developer.**

A. For Black Tones.

| | |
|---|---|
| Neutral oxalate potassium | 8 oz. |
| Phosphate potassium | 1 oz. |
| Water | 30 oz. |

B. For Sepia Tones.

| | |
|---|---|
| Of above mixed solution | 8 oz. |
| Saturated bichloride mercury solution | 1 oz. |
| Citrate soda | 5 gr. |

If deep red tones are desired add to B:

| | |
|---|---|
| Nitrate uranium | 10 gr. |

then filter and use as a developer.

## ANGELO PLATINUM PAPER.

**Developer.** Mr. Di Nunzio's formula for rich, warm, black tones is as follows:

| | |
|---|---|
| Neutral oxalate of potash | 1 lb. |
| Hot water | 100 oz. |

When cool, filter before using. In using old developer, always filter before begining to work.

If more of blue-black is desired, it may be obtained by using a developing solution prepared by the makers of the paper, or the following formula may be employed:

| | |
|---|---|
| Neutral oxalate of potash | 14 oz. |
| Phosphate of soda | 2 oz. |
| Oxalic acid | 1 drm. |
| Water | 80 oz. |

Very warm black tones may be had by use of warm development, as follows:

| | |
|---|---|
| Neutral oxalate of potash | 1 lb. |
| Carbonate of soda | ⅛ oz. |
| Water | 100 oz. |

**Sepia Prints on Black and White Paper** are made by using 1 to 2 oz. of our sepia solution to 16 oz. of

| | |
|---|---|
| Neutral oxalate of potash | 1 lb. |
| Hot water | 100 oz. |

Print as you would for black and white. In making up the bath, after adding the sepia solution, boil for a few minutes, and, when cool enough to not scorch your fingers, proceed with your developing. After developing, treat prints in two changes of muriatic baths (one-half oz. of acid to 60 oz. of water), and wash them as usual.

## AMERICAN PLATINUM PAPER.

**Developing.** The developer is simply neutral postassium oxalate and water; two ounces of neutral potassium oxalate dissolved in ten fluid ounces of water. If tones, more on the blue black, are desired, use the following developer:

| | |
|---|---|
| Water | 10 oz. |
| Potassium oxalate | 1 oz. |
| Potassium phosphate | ½ oz. |

In preparing developer containing potassium phosphate, always use warm water, as this chemical does not dissolve freely in cold water. Any amount of the developer may be made up and set-aside for future use, but should be kept in a well-stoppered bottle. Use sufficient developer to cover the bottom of the tray at least one-half inch deep. Develop prints face up. By sliding prints under developer, face up, air-bells are avoided, and the development may be closely watched from the start.

**Clearing Bath**. As soon as prints are fully developed, they are placed, face down, directly into a clearing bath of muriatic acid and water—one ounce of muriatic acid C. P., to 60 oz. of water. The quality of acid used is of much importance. It should be chemically pure, as ordinary commercial acid will cause yellow prints. Prints should have from three to four changes of acid clearing bath, allowing them to remain in each bath eight to ten minutes, and keeping them separated. The last acid bath should be as clear as pure water, showing no yellow tint.

## W. & C. PLATINOTYPE.

**Development.**—The whole contents of the box of the W. & C. developing salts must be dissolved at one time, as the salts are mixed; and if this be not done, too large a proportion of one of the ingredients may be used.

Development should be conducted in a feeble white light, similar to that used when cutting up the paper, or by gas light.

It may take place immediately after the print is exposed, or at the end of the day's printing.

Develop by floating the print, exposed side downwards, on the developing solution.

Development may take 30 seconds or more.

During the hot summer days it is not advisable to unduly delay the development of exposed prints. If possible develop within one hour after printing.

Either porcelain or agate—preferably porcelain—dishes are necessary to hold the developing solution.

To clear the developed prints: these must be washed in a series of baths (not less than three) of a weak solution of muriatic acid C. P. This solution is made by mixing one part of acid in 60 parts of water.

*As soon* as the print has been removed from the developing dish it must be *immersed face downwards* in the first bath of this acid, contained in a porcelain dish, in which it should remain about five minutes; meanwhile, other prints follow until all are developed. The prints must then be removed to a second acid-bath for about ten minutes; afterwards to the third bath for about fifteen minutes. While the prints remain in these acid-baths they should be moved so that the solution has free access to their surfaces, but care should be taken not to abrade them by undue friction,

*Pure* muriatic acid *must be used.*

If commercial muriatic acid be used, the prints will be discolored and turn yellow.

For each batch of prints fresh acid-baths must be used.

After the prints have passed through the acid-baths, they should be well washed in three changes of water during about a half hour. It is advisable to add a pinch of washing soda to the second washing water to neutralize any acid remaining in the print. Do not use water that contains iron, as it tends to turn paper yellow. Soft water is the best for this purpose.

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## W. & C. SEPIA PAPER.

With a few exceptions the method of carrying out the operations is the same as for the "black" kinds of platinotype paper. The *following points* should be attended to:

The "Sepia" paper is more easily affected by faint light, and, therefore, increased care must be taken when printing.

To develop, add to each ounce of the developing solution 1½ drachms of sepia solution supplied for this purpose, and proceed as described for black paper.

The solution must be heated to a temperature of 150 to 160 deg. Fahr., to obtain the greatest amount of brilliance and the warmest color, but very good results can be obtained by using a cooler developer.

## BLUE-PRINT FORMULAE.

### No. 1.

| | |
|---|---|
| Citrate of iron and ammonia | 1⅞ oz. |
| Water | 8 oz. |

### No. 2.

| | |
|---|---|
| Ferricyanide of potassium | 1¼ oz. |
| Water | 8 oz. |

Mix equal parts of No. 1 and No. 2, and apply with brush or by floating for three minutes. Plain Rives paper should be used; hang up to dry in darkened room.

### Black Lines upon a White Ground.

| | |
|---|---|
| Gelatine | 8 dr. |
| Perchloride of iron solution (U. S. P.) | 6 dr. |
| Tartaric acid | 3 dr. |
| Ferric sulphate | 3 dr. |
| Water | 9 oz. |

Filter off any precipitate that may be found, and coat any good, stout, white paper with the full-strength solution. Expose in sunlight till details or lines are visible, and develop with

| | |
|---|---|
| Gallic acid | 6 dr. |
| Alcohol | 6½ oz. |
| Water | 32 oz. |

Wash well in several changes of water.

The sensitizing solution is as follows:

| | |
|---|---|
| Gum arabic | 15 gr. |
| Tartaric acid | 2 gr. |
| Chloride of sodium (common salt) | 9 gr. |
| Sulphate of iron | 10 gr. |
| Iron perchloride | 15 gr. |
| Water | 110 c. c. |

In mixing the solution, the gum arabic is first dissolved in the water by the aid of heat, and the other salts are added while the solution is still warm. The solution is spread over the surface of the paper with a sponge, and, after allowing a little time for it to penetrate the surface, all superfluous moisture is removed, using the sponge again, well wrung out.

Development is by a plain aqueous solution of gallic acid. After development the print is rapidly washed, when superfluous moisture is carefully sponged off the surface.

## TO REMOVE STAINS FROM THE HANDS.

Development Stains.—Yield easily to the action of lemon juice.

Nitrate of Silver Stains.—Prepare a solution of water 100 cc.; chloride of lime, 25 grms.; sulphate of soda, 50 grms. Apply with a tooth-brush.

Pyro Stains.—Wash stained parts with a 10 per cent. solution of oxalic acid.

Amidol Stains.—Difficult to remove. Try citric acid.

Nitric Acid Stains.—Apply to stained parts a solution of permanganate of potash. Then wash freely.

# ENLARGEMENTS.

*From the British Journal of Photography Almanac.*

| Focus of Lens. | Times of Enlargement and Reduction. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Inches. | 1 Inch. | 2 Inches | 3 Inches. | 4 Inches. | 5 Inches. | 6 Inches. | 7 Inches. | 8 Inches. |
| 2 | 4<br>4 | 6<br>3 | 8<br>2 2/3 | 10<br>2 1/2 | 12<br>2 2/5 | 14<br>2 1/3 | 16<br>2 2/7 | 18<br>2 1/4 |
| 2 1/2 | 5<br>5 | 7 1/2<br>3 3/4 | 10<br>3 1/3 | 12 1/2<br>3 1/8 | 15<br>3 | 17 1/2<br>2 9/10 | 20<br>2 6/7 | 22 1/2<br>2 3/16 |
| 3 | 6<br>6 | 9<br>4 1/2 | 12<br>4 | 15<br>3 3/4 | 18<br>3 3/5 | 21<br>3 1/2 | 24<br>3 3/7 | 27<br>3 3/8 |
| 3 1/2 | 7<br>7 | 10 1/2<br>5 1/4 | 14<br>4 2/3 | 17 1/2<br>4 3/4 | 21<br>4 1/5 | 24 1/2<br>4 1/12 | 28<br>4 | 31 1/2<br>3 9/10 |
| 4 | 8<br>8 | 12<br>6 | 16<br>5 1/3 | 20<br>5 | 24<br>4 4/5 | 28<br>4 2/3 | 32<br>4 4/7 | 36<br>4 1/2 |
| 4 1/2 | 9<br>9 | 13 1/2<br>6 3/4 | 18<br>6 | 22 1/2<br>5 3/5 | 27<br>5 2/5 | 31 1/2<br>5 1/4 | 36<br>5 1/7 | 40 1/2<br>5 1/16 |
| 5 | 10<br>10 | 15<br>7 1/2 | 20<br>6 2/3 | 25<br>6 1/4 | 30<br>6 | 35<br>5 5/6 | 40<br>5 5/7 | 45<br>5 5/8 |
| 5 1/2 | 11<br>11 | 16 1/2<br>8 1/4 | 22<br>7 1/3 | 27 1/2<br>6 4/5 | 33<br>6 1/2 | 38 1/2<br>6 5/12 | 44<br>6 2/7 | 49 1/2<br>6 3/16 |
| 6 | 12<br>12 | 18<br>9 | 24<br>8 | 30<br>7 1/2 | 36<br>7 1/5 | 42<br>7 | 48<br>6 6/7 | 54<br>6 3/4 |
| 7 | 14<br>14 | 21<br>10 1/2 | 28<br>9 1/3 | 35<br>8 3/4 | 42<br>8 2/5 | 49<br>8 1/6 | 56<br>8 | 63<br>7 7/8 |
| 8 | 16<br>16 | 24<br>12 | 32<br>10 2/3 | 40<br>10 | 48<br>9 3/5 | 56<br>9 1/3 | 64<br>9 1/7 | 72<br>9 |
| 9 | 18<br>18 | 27<br>13 1/2 | 36<br>12 | 45<br>11 1/4 | 54<br>10 4/5 | 63<br>10 1/2 | 72<br>10 2/7 | 81<br>10 1/8 |

The object of this table is to enable any manipulator who is about to enlarge (or reduce) a copy any given number of times to do so without troublesome calculation. It is assumed that the photographer knows exactly what the focus of his lens is, and that he is able to measure accurately from its optical center. The use of the table will be seen from the following illustration: A photographer has a *carte* to enlarge to four times its size, and the lens he intends employing is one of 6 inches equivalent focus. He must therefore look for 4 on the upper horizontal line and for 6 in the first vertical column, and carry his eye to where these two join, which will be at 30 7½. The greater of these is the distance the sensitive plate must be from the center of the lens; and the lesser, the distance of the picture to be copied. To *reduce* a picture any given number of times, the same method must be followed; but in this case the greater number will represent the distance between the lens and the picture to be copied, the latter that between the lens and the sensitive plate. This explanation will be sufficient for every case of enlargement or reduction.

If the focus of the lens be 12 inches, as this number is not in the column of focal lengths, look out for 6 in this column and multiply by 2, and so on with any other numbers.

## Table of Symbols, Atomic Weight and Solubilities of the Principal Chemicals used in Photography.

*Abbreviations.*—s., soluble ; v. s., very soluble ; sp. s., sparingly soluble ; n. s., not soluble ; dec., decomposed ; del., deliquescent.

| NAME. | SYMBOL. | MOLECULAR WEIGHT. | ONE PART IS SOLUBLE IN COLD WATER | ONE PART IS SOLUBLE IN HOT WATER. | ALCOHOL. |
|---|---|---|---|---|---|
| Acid, Acetic | $C_2H_4O_2$ | 60 | in any proportion. | | |
| " Boric or Boracic | $H_3BO_3$ | 62 | 25 | 3 | 6 |
| " Carbolic (see Phenol) | $C_6H_6O$ | 94 | 16.6 | 3 | 6 |
| " Citric | $C_6H_8O_7+H_2O$ | 210 | 0.75 | 0.5 | s. |
| " Digallic (see Tannin) | $C_{14}H_{10}O_9$ | 322 | 0.8 | 0.5 | 0.8 |
| " Gallic | $C_7H_6O_5$ | 170 | 100 | 3 | 8 |
| " Hydrobromic | HBr | 81 | s. | s. | s. |
| " Hydroiodic | HI | 128 | s. | s. | s. |
| " Hydrochloric | HCl | 36.5 | s. | s. | s. |
| " Hydrofluoric | HFl | 20 | s. | s. | s. |
| " Hydrocyanic | HCy or CN | 27 | s. | s. | s. |
| " Hydrosulphuric | $H_2S$ | 34 | s. | s. | s. |
| " Muriatic (see Hydrochloric) | | | | | |
| " Nitric | $HNO_3$ | 63 | in all proportions. | | |
| " Nitrous | $HNO_2$ | 47 | absorbed. | | |
| " Oxalic | $C_2H_2O_4+2H_2O$ | 126 | 8 | 0.2 | s. also in ether |
| " Pyrogallic (see Pyrogallol) | $C_6H_6O_3$ | 126 | 2 | v. s. | also v. s. in ether. |
| " Salicylic | $C_7H_6O_3$ | 138 | 7.6 | 9 | also v. s. in ether. |
| " Sulphuric | $H_2SO_4$ | 98 | in any proportion. | | |
| " Sulphurous | $H_2SO_3$ | 82 | absorbed. | | |
| " Tannic (see Digallic) | | | | | |
| " Tartaric | $C_4H_6O_6$ | 150 | 0.8 | 0.5 | 5 |
| Alcohol, Ethyl | $C_2H_6O$ | 46 | in all proportions. | | |

| | | | | | |
|---|---|---|---|---|---|
| Alcohol, Methyl (see Wood Alcohol) | $CH_4O$ | 32 | in | all propor | tions. |
| Alum (see Potassium Aluminium Sulphate) | $Al_2(SO_4)_3K_2SO_4+24H_2O$ | 948.8 | 10 | 8 | n. s. |
| Alum Chrome (see Potassium Chromic Sulph.) | $Cr_2(SO_4)_3K_2SO_4+24H_2O$ | 998.4 | 10 | dec. | n. s. |
| Amidol (Diamido Phenol) | $C_6H_8N_2O$ | 124 | very | soluble. | |
| Ammonia, Gaseous | $NH_3$ | 17 | very | soluble. | ........ |
| Ammonium Bichromate | $(NH_4)_2Cr_2O_7$ | 252 | v. s. | v. s. | ........ |
| " Bromide | $NH_4Br$ | 98 | 1.29 | 0.7 | ........ |
| " Cadmium Bromide | $2NH_4Br2CdBr_2+H_2O$ | 678 | 0.73 | ........ | 31.5 |
| " " Iodide | $2NH_4ICdI_2+2H_2O$ | 545 | 0.58 | ........ | 5.3 |
| " Chloride | $NH_4Cl$ | 53.5 | 3 | 1 | 0.7 |
| " Ferric Oxalate | $Fe_2(C_2O_4)_6(NH_4)_6+8H_2O$ | 892 | 2.1 | 0.29 | sp s. |
| " Fluoride | $NH_4Fl$ | 37 | v. s. | v. s. | sp. s. |
| " Iodide | $NH_4I$ | 145 | 1 | 0.5 | sp. s. |
| " Nitrate | $NH_4NO_3$ | 80 | 2 | 1 | s. |
| " Oxalate | $(NH_4)_2C_2O_4$ | 124 | 4 | 2 | s. |
| " Persulphate | $(NH_4)SO_4$ | ........ | ........ | ........ | s. |
| " Sulpho-Cyanate | $NH_4CNS$ | 76 | s. | s. | s. |
| Aurantia (Hexanitro-diphenylamin Ammonia) | $NH_4C_{12}H_4(NO_2)_6N$ | 456 | ........ | ........ | ........ |
| Aurin (Trioxy-triphenyl Carbinol) | $C_{19}H_{14}O_3$ | 290 | ........ | ........ | ........ |
| Barium Chloride | $BaCl_2+2H_2O$ | 244 | 2.18 | 1.5 | sp. s. |
| " Nitrate | $Ba(NO_3)_2$ | 261 | 12.2 | 2.84 | n. s. |
| " Per-oxide | $BaO_2$ | 169 | v. s. | n. s. | n. s. |
| Benzole or Benzine (Trioxy-tryphenyl-Carbinol) | $C_6H_6$ | 78 | n. s. | n. s. | s. |
| Borax (see Sodium Biborate) | ........ | ........ | ........ | ........ | ........ |
| Cadmium Bromide | $CdBr_2+4H_2O$ | 344 | 1.5 | 1 | sp. s. |
| " Iodide | $CdI_2$ | 366 | 1.5 | 1 | s. |
| Calcium Bromide | $CaBr_2$ | 200 | 1 | .75 | s. |
| " Carbonate (see Chalk) | $CaCO_3$ | 100 | n. s. | n. s. | n. s. |
| " Chloride | $CaCl_2+6H_2O$ | 219 | .75 | .5 | 10 |
| " Hypochlorite (see Chloride of Lime) | $CaCl_2O_2CaCl_2$(?) | 254 | sp. s. | sp. s. | dec. |
| Calomel (see Mercurous Chloride) | ........ | ........ | ........ | ........ | ........ |
| Camphor | $C_{10}H_{16}O$ | 152 | 1000 | ........ | v. s. |
| Caustic Potash (see Potassium Hydrate) | ........ | ........ | ........ | ........ | ........ |
| " Soda (see Sodium Hydrate) | ........ | ........ | ........ | ........ | ........ |
| Chalk (see Calcium Carbonate) | ........ | ........ | ........ | ........ | ........ |

## Table of Symbols, Atomic Weight and Solubilities of the Principal Chemicals used in Photography.

*Abbreviations.*—s., soluble ; v. s., very soluble ; sp. s., sparingly soluble ; n. s., not soluble ; dec., decomposed ; del., deliquescent.

| NAME. | SYMBOL. | MOLECULAR WEIGHT. | ONE PART IS SOLUBLE IN COLD WATER | ONE PART IS SOLUBLE IN HOT WATER | ALCOHOL. |
|---|---|---|---|---|---|
| Chinoline Blue or Cyanine | $C_{29}H_{35}NaI$ | 533 | sp. s. | sp. s. | s. |
| " Red | $C_{26}H_{19}NaCl$ | 389.5 | | | |
| Chloride of Lime (see Calcium Hypochlorite) | | | | | |
| Chlorine | $Cl$ | 35.5 | absorbed by 1 to 2.5 vols. | | |
| Chloroform | $CHCl_3$ | 119.5 | sp. s. | sp. s. | v. s. |
| Chrome Alum (see Alum Chrome) | | | | | |
| Copper Acetate (see Verdigris) | $Cu(C_3H_3O_2)_2 + H_2O$ | 223.4 | 14 | 5 | 1 in 14 |
| " Bromide | $CuBr_2$ | 223.4 | 1 | .75 | s. |
| " Chloride | $CuCl_2 + H_2O$ | 152.4 | 1 | .75 | v. s. |
| " Sulphate (see Blue Vitriol) | $CuSO_4 + 5H_2O$ | 249.4 | 3 | 1 | n. s. |
| " " and Ammonia | $CuSO_4 + 4NH_3 + H_2O$ | 245.4 | s. | v. s. | n. s. |
| Corrosive Sublimate (see Mercuric Chloride) | | | | | |
| Dextrine | $C_6H_{10}O_5$ | 162 | easily s. | | n. s. |
| Eikonogen (Amido-β-Naphthol-β-Monosulphonate of Sodium) | $C_{10}H_8SO_4NaN$ | 261 | 40 | e. s. | s. |
| Eosine, Yellow Shade (Tetra Bromo-fluoresceine Potassium) | $C_{20}H_6Br_4O_5K_2$ | 724 | s. | s. | s. |
| Eosine, Red Shade (Tetra Brom.-fluores. Sod.) | $C_{20}H_6Br_4O_5Na_2$ | 692 | s. | s. | s. |
| Epsom Salt (see Magnesium Sulphate) | | | | | |
| Erythrosine M. (Tetra Iodo-fluoresceine Potassium or Sodium) | $C_{20}H_6I_4O_5K_2$ or $Na_2$ | 912 or 880 | s. | s. | s. |
| Erythrosine G. (Di-iodo-fluoresceine Potassium or Sodium) | $C_{20}H_6I_2O_5K_2$ or $Na_2$ | 658 or 626 | s. | s. | s. |

| | | | | | |
|---|---|---|---|---|---|
| Gelatine, Glutine | Unobtainable | ........ | sp. s. | e. s. | n. s. |
| Glycerine | $C_3H_8O_3$ | 92 | in all proportions. | | |
| Glycine (Oxy-phenylglycine) | $C_8H_9O_3N$ | 162 | ........ | ........ | ........ |
| Gold, Neutral Chloride | $AuCl_3$ | 302.5 | 1 | 5 | also in ether. |
| " and Cadmium Chloride | $AuCl_5Cd$ | 485.5 | s. | s. | s. |
| " and Potassium Chloride | $AuCl_4K+5H_2O$ | 467 | s. | s. | s. |
| " and Sodium Chloride | $AuCl_4Na+2H_2O$ | 397 | s. | s. | s. |
| " Sodium Hyposulphite | $AuNa_3S_4O_6+2H_2O$ | 525 | s. | s. | s. |
| Gun Cotton (Tetra-nitrate Cellulose) | $C_{12}H_{16}O_6(NO_3)_4$ | 504 | n. s. | n. s. | in ether |
| " " (Tri-nitrate Cellulose) | $C_{10}H_{17}O_7(NO_6)_3$ | 579 | n. s. | n. s. | alcohol |
| Hydrochinone | $C_6H_6O_2$ | 110 | s. | s. | also in ether. |
| Hydroxylamine Hydrochlorate | $NH_3OHCl$ | 69.5 | 0.6 | e. s. | 4 |
| Iodine | I | 127 | sp. s. | sp. s. | e. s. |
| Iridium Tetra Chloride | $IrCl_4$ | 335 | ........ | ........ | ........ |
| Iron, Ammonium Sulphate | $FeSO_4(NH_4)_2SO_4+6H_2O$ | 392 | v. s. | dec. | n. s. |
| " Chloride (Ferric) | $Fe_2Cl_6$ | 325 | .75 | .5 | 1 in 1 |
| " Chloride (Ferrous) | $Fe_2Cl_2$ | 127 | 2 | 1 | 1 in 1 |
| " Citrate | $Fe_2(C_6H_5O_7)_2$ | 490 | s. | s. | n. s. |
| " Citrate and Ammonium | $Fe_2(C_6H_5O_7)_2+(NH_4)_3$ | 544 | s. | s. | sp. s. |
| " Iodide | $FeI_2+4H_2O$ | 382 | v. s. | v. s. | v. s. |
| " Nitrate | $Fe(NO_3)_2+6H_2O$ | 238 | v. s. | dec. | dec. |
| " Oxalate (Ferric) | $Fe_2(C_2O_4)_3$ | 376 | s. | s. | n. s. |
| " " (Ferrous) | $FeC_2O_4$ | 144 | in potassium oxal. | | n. s. |
| " Sulphate (Ferric) | $Fe_2(SO_4)_3+9H_2O$ | 566 | s. | dec. | s. |
| " " (Ferrous) | $FeSO_4+7H_2O$ | 278 | 1.5 | 1 | n. s. |
| Kaoline | $Al_2Si_2O_7+2H_2O$ | 258.8 | not soluble. | | ........ |
| Lead, Acetate (see Sugar of Lead) | $Pb(C_2H_3O_2)_2$ | 325 | 2.5 | 2 | 1 in 12.5 |
| " Carbonate | $PbCO_3$ | 267 | n. s. | sp. s. | n. s. |
| " Iodide | $PbI_2$ | 461 | s. | s. | n. s. |
| " Nitrate | $Pb(NO_3)_2$ | 331 | 7.7 | 7 | s. |
| " Oxide | PbO | 223 | n. s. | n. s. | Alkalis. |
| Lithium, Bromide | LiBr | 87 | .66 | .5 | v. s. |
| " Chloride | $LiCl+H_2O$ | 60.5 | 1.3 | 1 | s. |
| " Iodide | $LiI+3H_2O$ | 188 | .61 | .5 | s. |
| Magnesium, Bromide | $MgBr_2$ | 184.4 | 1 | .75 | s. |

## Table of Symbols, Atomic Weight and Solubilities of the Principal Chemicals used in Photography.

*Abbreviations.*—s., soluble ; v. s., very soluble ; sp. s., sparingly soluble ; n. s., not soluble ; dec., decomposed ; del., deliquescent.

| NAME. | SYMBOL. | MOLECULAR WEIGHT. | ONE PART IS SOLUBLE IN COLD WATER | ONE PART IS SOLUBLE IN HOT WATER. | ALCOHOL. |
|---|---|---|---|---|---|
| Magnesium, Chloride | $MgCl_2$ | 95.4 | 2 | 1.5 | s. |
| " Iodide | $MgI_2$ | 278.4 | 1 | .75 | v. s. |
| " Sulphate (see Epsom Salt | $MgSO_4,7H_2O$ | 246.4 | 1.3 | 1 | sp. s. |
| Manganous Chloride | $MnCl_2+4H_2O$ | 198 | s. | s. | n. s. |
| Mercury, Chloride (Mercuric)(see Corr. Subl ) | $HgCl_2$ | 271 | 19 | 3 | 5 |
| " " (Mercurous) (see Calomel). | $Hg_2Cl_2$ | 471 | n. s. | n. s. | n. s. |
| " Cyanide | $HgCy_2$ or $(CN)_2$ | 252 | 8 | 2 | 1 in 20 |
| " Iodide (Mercuric) | $HgI_2$ | 454 | sp. s. | sp. s. | sp. s. |
| " " (Mercurous) | $Hg_2I_2$ | 654 | n. s. | n. s. | n. s. |
| Metol (Mono-methyl Para-amidometakresol). | $C_8H_{11}NO$ | 137 | s. | s. | s. |
| Para-amidophenol | $C_6H_7NO$ | 109 | sp. s. | s. | |
| Para-amidophenol Sodium | $C_6H_6NaNO$ | 131 | easily | soluble. | |
| Para-amidophenol Hydrochlorate | $C_6H_7NOHCl$ | 145.5 | s. | s. | s. |
| Para-rosaniline (Triamido-phenyl-Carbinol). | $C_{19}H_{19}N_3O$ | 305 | | | |
| Phenol (see Carbolic Acid) | | | | | |
| Platino-potassium Chloride or Chloro-platinite | $K_2PtCl_4$ | 417.4 | 6. | | s. |
| Platino-sodium Chloride or Chloro-platinite of Sodium | $Na_2PtCl_4$ | 385.4 | solu | ble. | |
| Platinum Chloride | $PtCl_4+5H_2O$ | 429.4 | | * | |
| Potassa (see Potassium Hydrate) | | | | | |

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* Real platinum-chloride is but little soluble in water ; the article of commerce of that name answers to the formula $PtCl_4 2HCl+6H_2O$, and is of the atomic weight 520.4 (K. Schwier). It is easily soluble in water, probably in the proportion of 1.6.

|  |  |  |  |  |  |
|---|---|---|---|---|---|
| Potassium, Aluminium Sulphate (see Alum). |  |  |  |  |  |
| " Bicarbonate | $KHCO_3$ | 100 | 3 | 2 | n. s |
| " Bichromate | $K_2Cr_2O_7$ | 294.4 | 10 | 7 | n. s. |
| " Bromide | $KBr$ | 119 | 2 | 1 | 1 in 90 |
| " Carbonate | $K_2CO_3$ | 138 | .75 | .5 | n. s. |
| " Chlorate | $KClO_3$ | 122.5 | 16 | 2 | n. s. |
| " Chloride | $KCl$ | 74.5 | 3 | 2 | sp. s. |
| " ChromicSulph.(see Chrome Alum) |  |  |  |  |  |
| " Citrate | $K_3C_6H_7O_8$ | 324 | 6.6 | .3 | n. s. |
| " Cyanide | $KCy$ or $(CN)$ | 65 | 1 | .5 | sp. s. |
| " Ferric Sulphate | $K_2SO_4 + Fe_2(SO_4)_3 + 24H_2O$ | 957 | s. | s. | n. s. |
| " Ferri-cyanide (see Red Prussiate) | $K_3FeCy_6$ | 329.3 | 2.5 | 1.2 | n. s. |
| " Ferro-cyanide (see Yellow Pruss.) | $K_4FeCy_6 + 3H_2O$ | 422 | 3 | 1 | n. s. |
| " Fluoride | $KFl$ | 58 | v. s. | v. s. | n. s. |
| " Hydrate | $KOH$ | 56 | .5 | .25 | v. s. |
| " Iodide | $KI$ | 166 | .75 | .5 | sp. s. |
| " Nitrate (see Saltpetre) | $KNO_3$ | 101 | 4 | 1 | 1 in 16 |
| " Oxalate | $K_2C_2O_4 + 2H_2O$ | 202 | 3 | 2 | n. s. |
| " Permanganate | $KMnO_4$ | 158 | 16 | 10 | sp. s. |
| " Sulpho-cyanate | $KCyS$ | 97 | 2 | 1 | n. s. |
| Pyrogallol (see Pyrogallic Acid) |  |  |  |  | sp. s. |
| Rhodan (German appellation for Cyanates) |  |  |  |  |  |
| Rodinal (ready-prepared Para-amido Devel.) |  |  |  |  |  |
| Silver, Acetate | $AgC_2H_3O_2$ | 167 | sp. s. | sp. s. | n. s. |
| " Bromide | $AgBr$ | 188 | n. s. | n. s. | in HCl and HBr. |
| " Carbonate | $Ag_2CO_3$ | 276 | n. s. | n. s. | n. s. |
| " Chloride | $AgCl$ | 143.5 | n. s. | n. s. | Ammonia. cyan. potass. hyposulphite of soda. |
| " Citrate | $Ag_3C_6H_5O_7$ | 513 | sp. s. | sp. s. |  |
| " Fluoride | $AgFl$ | 127 | v. s. | v. s. | v. s. |
| " Iodide | $AgI$ | 235 | n. s. | n. s. | same as Chloride. |
| " Nitrate | $AgNO_3$ | 170 | 1 | .5 | sp. s. |

## Table of Symbols, Atomic Weight and Solubilities of the Principal Chemicals used in Photography.

*Abbreviations.*—s., soluble ; v. s., very soluble ; sp. s., sparingly soluble ; n. s., not soluble ; dec., decomposed ; del., deliquescent.

| Name. | Symbol. | Molecular Weight. | One Part is Soluble in Cold Water | One Part is Soluble in Hot Water. | Alcohol. |
|---|---|---|---|---|---|
| Silver, Nitrite | $AgNO_3$ | 154 | 300 | dec. | n. s. |
| " Oxalate | $Ag_2C_2O_4$ | 302 | sp. s. | s. | n. s. |
| " Oxide | $Ag_2O$ | 232 | n. s. | n. s. | n. s. |
| " Sulphide | $Ag_2S$ | 248 | n. s. | n. s. | n. s. |
| Soda, Caustic (see Sodium Hydrate) | | | | | |
| Sodium Acetate | $NaC_2H_3O_2+3H_2O$ | 136 | 3 | .66 | n. s. |
| " Biborate (Borax) | $Na_2B_4O_7+10H_2O$ | 382 | 12.5 | 2 | n. s. |
| " Bromide | $NaBr$ | 103 | 1.25 | 1 | 1.16 |
| " Bicarbonate | $NaHCO_3$ | 84 | 12 | dec. | n. s. |
| " Carbonate | $Na_2CO_3+10H_2O$ | 286 | 2 | 1 | n. s. |
| " Chloride | $NaCl$ | 58.5 | 2.75 | 2.75 | n. s. |
| " Citrate | $Na_3C_6H_5O_7$ | 258 | 1 | .5 | sp. s. |
| " Hydrate | $NaHO$ | 40 | 1.5 | .5 | sp. s. |
| " Hypo-sulphite | $Na_2S_2O_3+5H_2O$ | 248 | 1.5 | 1 | sp. s. |
| " Iodide | $NaI$ | 150 | .5 | .3 | sp. s. |
| " Nitrate | $NaNO_3$ | 85 | 1.36 | 1 | 1 in 37 |
| " Sulph-antimoniate or Schlippe's Salt | $Na_3SbS_4$ | 317 | s. | s. | n. s. |
| " Sulphate | $Na_2SO_4+10H_2O$ | 322 | 2 | 4 | s. |
| " Sulphide | $Na_2S+9H_2O$ | 240 | s. | s. | sp. s. |
| " Sulphite | $Na_2SO_3+7H_2O$ | 252 | 4 | 2 | sp. s. |
| " Tungstate | $Na_2WO_4+2H_2O$ | 330 | s. | s. | n. s. |
| " Thio-sulphate (see Hypo-sulphite) | | | | | |
| Strontium, Bromide | $SrBr_2+6H_2O$ | 355.5 | 1 | .75 | sp. s. |
| " Chloride | $SrCl_2+6H_2O$ | 266.5 | 1.8 | 1 | sp. s. |

| | | | | | |
|---|---|---|---|---|---|
| Strontium, Nitrate | $Sr(NO_3)_2$ | 211.5 | 5 | 2 | sp. s. |
| Sugar of Lead (see Lead Acetate) | ........ | ........ | ........ | ........ | ........ |
| Tannin (see Digallic Acid) | ........ | ........ | ........ | ........ | ........ |
| Thymol | $C_6H_3(CH_3(C_3H_7)COO$ | 177 | sp. | ........ | and in ether. |
| Tin, Chloride (Stannic) | $SnCl_4$ | 260 | dec. | in much | water. |
| " Chloride (Stannous) | $SNCl_2+2H_2O$ | 225 | 135:100 | 655:100 | v. s. |
| Uranium, Bromide | $UBr_2+4H_2O$ | 472 | 1 | .5 | sp. s. |
| " Nitrate | $UO_2(NO_3)_2+6H_2O$ | 504 | .5 | .25 | v. s. |
| " Sulphate | $UO_2SO_4+3H_2O$ | 422 | .5 | .25 | v. s. |
| Verdigris (see Copper Acetate) | ........ | ........ | ........ | ........ | ........ |
| Vitriol, Blue (see Copper Sulphate) | ........ | ........ | ........ | ........ | ........ |
| " Green (see Iron Sulphate) | ........ | ........ | ........ | ........ | ........ |
| " White (see Zinc Sulphate) | ........ | ........ | ........ | ........ | ........ |
| Water | $H_2O$ | 18 | ........ | ........ | ........ |
| Washing Soda (see Sodium Carbonate) | ........ | ........ | ........ | ........ | ........ |
| Wood Alcohol (see Alcohol Methyl) | ........ | ........ | ........ | ........ | ........ |
| Zinc, Bromide | $ZnBr_2$ | 225 | del. | and e. s. | s. |
| " Chloride | $ZnCl_2$ | 136 | .33 | ........ | s. |
| " Iodide | $ZnI_2$ | 319 | .33 | dec. | v. s. |
| " Nitrate | $Zn(NO_3)_2+6H_2O$ | 297 | del. | del. | del. |
| " Sulphate (see White Vitriol) | $ZnSO_4+7H_2O$ | 287 | 2 | 1 | n. s. |
| Zircon Earth | $ZrO_2$ | 122 | n. s. | n. s. | n s. |

## Relative Brilliancy of Artificial Lights.

| No. | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Sun at Midday, June 21,—1...... ............ | 1 | ...... | ...... | ...... | ...... | ...... | ...... | ...... | ...... |
| 2 | Light of Magnesium Lamp (burning 1 gram of powder)...................... ......... | 3 | 1 | ...... | ...... | ...... | ...... | ...... | ...... | ...... |
| 3 | Magnesium Ribbon, 3 mm. wide............. | 14 | 5 | 1 | ...... | ...... | ...... | ...... | ...... | ...... |
| 4 | Electric Arc Lamp...................... .... | 35 | 11 | 2.5 | 1 | ...... | ...... | ...... | ...... | ...... |
| 5 | Oxyhydrogen Light........................ | 50 | 16 | 3.6 | 1.4 | 1 | ...... | ...... | ...... | ...... |
| 6 | Gas, Welsbach System...................... | 165 | 53 | 11 | 7 | 10 | 1 | ...... | ...... | ...... |
| 7 | Incandescent Electric Lamp, (24 volts)......... | 1,600 | 533 | 115 | 46 | 32 | 10 | 1 | ...... | ...... |
| 8 | Oil of Petroleum Lamp............ ..... .... | 2,300 | 766 | 165 | 66 | 46 | 14 | 1.4 | 1 | ...... |
| 9 | Stearine Candle.............................. | 18,000 | 6,000 | 1,300 | 515 | 360 | 109 | 11 | 7 | 1 |

By means of this table, the nine chief sources of light above given can be compared with each other as to their relative brilliancy.

Example.—Compared with the sun, the Welsbach Gas Light is 165 less brilliant, but is 10 times more brilliant than the electric incandescent lamp, and 109 more brilliant than the light from a stearine candle.

## Elsden's Table of Poisons and Antidotes.

| | Poisons. | Remarks. | Characteristic Symptoms. | Antidote. |
|---|---|---|---|---|
| Vegetable Acids. | **Oxalic Acid.** including **Potassium Oxalate.** | 1 dram is the smallest fatal dose known. | Hot, burning sensation in throat and stomach; vomiting, cramps, and numbness. | Chalk, whiting or magnesia, suspended in water. Plaster or mortar can be used in emergency. |
| Caustic Alkalies. | **Ammonia.**<br>**Potash.**<br>**Soda.** | Vapor of ammonia may cause inflammation of the lungs. | Swelling of tongue, mouth, and fauces; often followed by stricture of the œsophagus. | Vinegar and water. |
| Metallic Salts. | **Mercuric Chloride.** | 3 grains the smallest known fatal dose. | Acrid, metallic taste, constriction and burning in throat and stomach, followed by nausea and vomiting. | White and yolk of raw eggs with milk. In emergency, flour paste may be used. |
| | **Acetate of Lead.** | The sub-acetate is still more poisonous. | Constriction in the throat and at pit of stomach; crampy pains and stiffness of abdomen; blue line round the gums. | Sulphates of soda or magnesia. Emetic of sulphate of zinc. |
| | **Cyanide of Potassium.** | *a*. Taken internally, 3 grs. fatal.<br>*b*. Applied to wounds and abrasures of the skin. | Insensibility, slow, gasping respiration, dilated pupils, and spasmodic closure of the jaws.<br>Smarting sensation. | No certain remedy; cold affusion over the head and neck most efficacious.<br>Sulphate of iron should be applied immediately. |
| | **Bichromate of Potassium** | *a*. Taken internally.<br>*b*. Applied to slight abrasions of the skin. | Irritant pain in stomach, and vomiting.<br>Produces troublesome sores and ulcers. | Emetics and magnesia, or chalk. |
| | **Nitrate of Silver.** | | Powerful irritant. | Common salt to be given immediately, followed by emetics. |
| Concentrated Mineral Acids. | **Nitric Acid.** | 2 drams have been fatal. Inhalation of the fumes has also been fatal. | Corrosion of windpipe and violent inflammation. | Bicarbonate of soda, or carbonate of magnesia or chalk, plaster of the apartment beaten up in water. |
| | **Hydrochloric Acid.** | ½ ounce has caused death. | | |
| | **Sulphuric Acid.** | 1 dram has been fatal. | | |
| | **Acetic Acid**, concentrated, has as powerful an effect as the mineral acids. | | | |
| | **Iodine.** | Variable in its action; 3 grains have been fatal. | Acrid taste, tightness about the throat, vomiting. | Vomiting should be encouraged, and gruel, arrowroot and starch given freely. |
| | **Ether.** | When inhaled. | Effects similar to chloroform. | Cold affusion and artificial respiration. |
| | **Pyrogallol.** | 2 grains sufficient to kill a dog. | Resemble phosphorus poisoning. | No certain remedy. Speedy emetic desirable. |

PASTE THIS TABLE UP IN YOUR WORKROOM.

## Treatment of Residues.

| NATURE OF WASTE. | TREATMENT. | RESULT OF OPERATION. | EXTRACTION OF PRECIOUS METAL. |
|---|---|---|---|
| Old hypo and fixing baths. | Add a small quantity of a strong solution of potassium sulphide, and silver will be precipitated in the form of a dense brown fluculent cloud; which stir, and allow to settle. | Collect the resulting precipitate of sulphide of silver, and allow to dry. | Mix with equal weight of sodium carbonate, 2 parts, potassium nitrate, 1 part, and fuse in a crucible. |
| Solid residues (cuttings of silver paper, old filters, etc.). | Burn. | Collect the ashes. | Mix with equal weight of sodium carbonate, 2 parts, potassium nitrate, 1 part, and fuse in a crucible. |
| Old combined toning and fixing sulpho-cyanide baths. | Add a small quantity of hydrochloric acid and ferrous sulphate, which give a precipitate of metallic gold mixed with hydrous perchloride of iron. | Collect, and dry. | Fuse in a crucible to collect the gold and silver. |
| Old platinotype baths (oxalate of potassium). | Add to each liter (1,000 cc.) of old oxalate bath, 330 cc. of a concentrated solution of sulphate of iron, and heat to boiling point. | The resulting black precipitate is pure platinum. | Collect, wash well. and dry on a filter. |
| Acid fixing baths (platinotype process). | Add ferrous developing solution. | Metallic platinum is formed (mixed with small quantity of iron. | Eliminate the iron by treating with sulphuric acid, then wash. |
| Silver from sensitive films. | Place sensitized plates, etc., in 100 cc. of hydrochloric acid; pour the whole into a beaker, and add 100 cc. of sulphuric acid, and heat. | Silver forms at the bottom of the beaker; allow to settle, and decant. | The residue is mixed with 5 parts of charcoal and 70 parts of sawdust, and heated to bright red in a crucible for an hour. A button of silver will be found at the bottom after the operation. |

# United States Weights and Measures.

ACCORDING TO EXISTING STANDARDS.

## LINEAL.

12 inches = 1 foot.
3 feet = 1 yard.
5.5 yards = 1 rod.
40 rods = 1 furlong.
8 furlongs = 1 mile.

| Inches. | Feet. | Yards. | Rods. | Fur's. | Mile. |
|---|---|---|---|---|---|
| 12 | 1 | | | | |
| 36 | 3 | 1 | | | |
| 198 | 16.5 | 5.5 | 1 | | |
| 7,920 | 660 | 220 | 40 | 1 | |
| 63,360 | 5,280 | 1,760 | 320 | 8 | 1 |

## SURFACE—LAND.

144 sq. ins. = 1 sq ft.
9 sq. ft. = 1 sq. yard.
30.25 sq. yds. = 1 sq. rod.
40 sq. rods = 1 sq. rood.
4 sq. roods = 1 acre.
640 acres = 1 sq. mile.

| Feet. | Yards. | Rods. | Roods. | Acres. |
|---|---|---|---|---|
| 9 | 1 | | | |
| 272.25 | 30.25 | 1 | | |
| 10,890 | 1,210 | 40 | 1 | |
| 43,560 | 4,840 | 160 | 4 | 1 |
| 27,878,400 | 3,097,600 | 102,400 | 2,560 | 640 |

## VOLUME—LIQUID.

4 gills = 1 pint.
2 pints = 1 quart.
4 quarts = 1 gallon.

| Gills. | Pints. | Gallon. | Cub. In. |
|---|---|---|---|
| 32 | 8 | 1 | 231 |

## FLUID.

| Gallon. | Pints. | Ounces. | Drachms. | Minims. | Cubic Centimetres. |
|---|---|---|---|---|---|
| 1 | 8 | 128 | 1,024 | 61,440 | 3,785.435 |
| | 1 | 16 | 128 | 7,680 | 473.179 |
| | | 1 | 8 | 480 | 29.574 |
| | | | 1 | 60 | 3.697 |

16 ounces, or a pint, is sometimes called a fluid pound.

## TROY WEIGHT.

| Pound. | Ounces. | Pennyweights. | Grains. | Grams. |
|---|---|---|---|---|
| 1 | 12 | 240 | 5,760 | 373.24 |
| | 1 | 20 | 480 | 31.10 |
| | | 1 | 24 | 1.56 |

## APOTHECARIES' WEIGHT.

| lb. Pound. | ℥ Ounces. | ʒ Drachms. | ℈ Scruples. | gr. Grains. | Grams. |
|---|---|---|---|---|---|
| 1 | 12 | 96 | 288 | 5,760 | 373.24 |
| | 1 | 8 | 24 | 480 | 31.10 |
| | | 1 | 3 | 60 | 3.89 |
| | | | 1 | 20 | 1.30 |
| | | | | 1 | .06 |

The pound, ounce, and grain are the same as in Troy weight.

## AVOIRDUPOIS WEIGHT.

| Pound. | Ounces. | Drachms. | Grains (Troy). | Grams. |
|---|---|---|---|---|
| 1 | 16 | 256 | 7,000 | 453.60 |
| | 1 | 16 | 437.5 | 28.35 |
| | | 1 | 27.34 | 1.77 |

## English Weights and Measures.

### APOTHECARIES' WEIGHT.

20 Grains = 1 Scruple = 20 Grains.
3 Scruples = 1 Drachm = 60 Grains.
8 Drachms = 1 Ounce = 480 Grains.
12 Ounces = 1 Pound = 5760 Grains.

#### FLUID MEASURE.

60 Minims = 1 Fluid Drachm
8 Drachms = 1 Fluid Ounce.
20 Ounces = 1 Pint.
8 Pints = 1 Gallon.

The above weights are usually adopted in formulas.

All Chemicals are usually sold by

### AVOIRDUPOIS WEIGHT.

$27\frac{11}{32}$ Grains = 1 Drachm = $27\frac{11}{32}$ Grains.
16 Drachms = 1 Ounce = $437\frac{1}{2}$ Grains.
16 Ounces = 1 Pound = 7000 Grains.

Precious Metals are usually sold by

### TROY WEIGHT.

24 Grains = 1 Pennyweight = 24 Grains.
20 Pennyweights = 1 Ounce = 480 Grains.
12 Ounces = 1 Pound = 5760 Grains.

NOTE.—An ounce of metallic silver contains 480 grains, but an ounce of nitrate of silver contains only 437½ grains.

## United States Fluid Measure.

| Gal. | Pints. | Ounces. | Drachms. | Mins. | Cub. In. | Grains. | Cub. C.M. |
|---|---|---|---|---|---|---|---|
| 1 = | 8 = | 128 = | 1,024 = | 61,440 = | 231. = | 58,328.886 = | 3,785.44 |
| | 1 = | 16 = | 128 = | 7,680 = | 28.875 = | 7,291.1107 = | 473.18 |
| | | 1 = | 8 = | 480 = | 1.8047 = | 455.6944 = | 29.57 |
| | | | 1 = | 60 = | 0.2256 = | 56.9618 = | 3.70 |

## Imperial British Fluid Measure.

| Gal. | Pints. | Ounces. | Drachms. | Mins. | Cub. In. | Grains. | Cub. C.M. |
|---|---|---|---|---|---|---|---|
| 1 = | 8 = | 160 = | 1,280 = | 76,800 = | 277.27384 = | 70,000 = | 4,543.732 |
| | 1 = | 20 = | 160 = | 9,600 = | 34.65923 = | 8,750 = | 567.966 |
| | | 1 = | 8 = | 480 = | 1.73296 = | 437.5 = | 28.398 |
| | | | 1 = | 60 = | 0.21662 = | 54.69 = | 3.550 |

# Metric System of Weights and Measures.

## MEASURES OF LENGTH.

| Denominations and Values. | | Equivalents in Use. | |
|---|---|---|---|
| Myriameter | 10,000 meters. | 6.2137 | miles. |
| Kilometer | 1,000 meters. | .62137 | mile, or 3,280 ft. 10 ins. |
| Hectometer | 100 meters. | 328. | feet and 1 inch. |
| Dekameter | 10 meters. | 393.7 | inches. |
| Meter | 1 meter. | 39.37 | inches. |
| Decimeter | 1-10th of a meter. | 3.937 | inches. |
| Centimeter | 1-100th of a meter. | .3937 | inch. |
| Millimeter | 1-1000th of a meter. | .0394 | inch. |

## MEASURES OF SURFACE.

| Denominations and Values. | | Equivalents in Use. | |
|---|---|---|---|
| Hectare | 10,000 square meters. | 2.471 | acres. |
| Are | 100 square meters. | 119.6 | square yards. |
| Centare | 1 square meter. | 1,550. | square inches. |

## MEASURES OF VOLUME.

| Denominations and Values. | | | Equivalents in Use. | |
|---|---|---|---|---|
| Names. | No. of Liters. | Cubic Measures. | Dry Measure. | Wine Measure. |
| Kiloliter or stere | 1,000 | 1 cubic meter. | 1.308 cubic yards. | 264.17 gallons. |
| Hectoliter | 100 | 1-10th cubic meter. | 2 bu. and 3.35 pecks. | 26.417 gallons. |
| Dekaliter | 10 | 10 cubic decimeters. | 9.08 quarts. | 2.6417 gallons. |
| Liter | 1 | 1 cubic decimeter. | .908 quart. | 1 0567 quarts. |
| Deciliter | 1-10 | 1-10th cubic decimeter. | 6.1023 cubic inches. | .845 gill. |
| Centiliter | 1-100 | 10 cubic centimeters. | .6102 cubic inch. | .338 fluid oz. |
| Milliliter | 1-1000 | 1 cubic centimeter. | .061 cubic inch. | .27 fl. drm. |

## WEIGHTS.

| Denominations and Values. | | | Equivalents in Use. |
|---|---|---|---|
| Names. | Number of Grams. | Weight of Volume of Water at its Maximum Density. | Avoirdupois Weight. |
| Millier or Tonneau | 1,000,000 | 1 cubic meter. | 2204.6 pounds. |
| Quintal | 100,000 | 1 hectoliter. | 220.46 pounds. |
| Myriagram | 10,000 | 10 liters. | 22.046 pounds. |
| Kilogram or Kilo | 1,000 | 1 liter. | 2.2046 pounds |
| Hectogram | 100 | 1 deciliter. | 3.5274 ounces. |
| Dekagram | 10 | 10 cubic centimeters. | .3527 ounce. |
| Gram | 1 | 1 cubic centimeter. | 15.432 grains. |
| Decigram | 1-10 | 1-10th of a cubic centimeter. | 1.5432 grain. |
| Centigram | 1-100 | 10 cubic millimeters. | .1543 grain. |
| Milligram | 1-1000 | 1 cubic millimeter. | .0154 grain. |

*For measuring surfaces*, the square dekameter is used under the term of ARE; the hectare, or 100 ares, is equal to about 2½ acres. *The unit of capacity* is the cubic decimeter or LITER, and the series of measures is formed in the same way as in the case of the table of lengths. The cubic meter is the unit of measure for solid bodies, and is termed STERE. *The unit of weight* is the GRAM, which is the weight of one cubic centimeter of pure water weighed in a vacuum at the temperature of 4 deg. Cent. or 39.2 deg. Fahr., which is about its temperature of maximum density. In practice, the term cubic centimeter abbreviated c.c., is generally used instead of milliliter, and cubic meter instead of kiloliter.

## The Conversion of French (Metric) into English Measure.

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | cubic centimeter | = | 17 | minims. | | | | | | | |
| 1 | cubic centimeters | = | 34 | " | | | | | | | |
| 3 | " | = | 51 | " | | | | | | | |
| 4 | " | = | 68 | " | or | 1 | dram | 8 | minims. | | |
| 5 | " | = | 85 | " | " | 1 | " | 25 | " | | |
| 6 | " | = | 101 | " | " | 1 | " | 41 | " | | |
| 7 | " | = | 118 | " | " | 1 | " | 58 | " | | |
| 8 | " | = | 135 | " | " | 2 | drams | 15 | " | | |
| 9 | " | = | 152 | " | " | 2 | " | 32 | " | | |
| 10 | " | = | 169 | " | " | 2 | " | 49 | " | | |
| 20 | " | = | 338 | " | " | 5 | " | 38 | " | | |
| 30 | " | = | 507 | " | " | 1 | ounce | 0 | dram | 27 | minims |
| 40 | " | = | 676 | " | " | 1 | " | 3 | drams | 16 | " |
| 50 | " | = | 845 | " | " | 1 | " | 6 | " | 5 | " |
| 60 | " | = | 1014 | " | " | 2 | ounces | 0 | " | 54 | " |
| 70 | " | = | 1183 | ' | " | 2 | " | 3 | " | 43 | " |
| 80 | " | = | 1352 | " | " | 2 | " | 6 | " | 32 | " |
| 90 | " | = | 1521 | " | " | 3 | " | 1 | " | 21 | " |
| 100 | " | = | 1690 | " | " | 3 | " | 4 | " | 10 | " |
| 1000 | " | = | 1 liter = 34 fluid ounces nearly, or 2⅛ pints. | | | | | | | | |

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## The Conversion of French (Metric) into English Weight.

The following table, which contains no error greater than one-tenth of a grain, will suffice for most practical purposes:

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | gram | = | 15⅖ | grains. | | | | | | |
| 2 | grams | = | 30⅘ | " | | | | | | |
| 3 | " | = | 46⅕ | " | | | | | | |
| 4 | " | = | 61⅘ | " | ........ | or | 1 | dram | 1⅘ | grain. |
| 5 | " | = | 77⅕ | " | ........ | " | 1 | " | 17⅕ | grains. |
| 6 | " | = | 92⅗ | " | ........ | " | 1 | " | 32⅗ | " |
| 7 | " | = | 108 | " | ........ | " | 1 | " | 48 | " |
| 8 | " | = | 123⅖ | " | ........ | " | 2 | drams | 3⅖ | " |
| 9 | " | = | 138⅘ | " | ........ | " | 2 | " | 18⅘ | " |
| 10 | " | = | 154⅖ | " | ........ | " | 2 | " | 34⅖ | " |
| 11 | " | = | 169⅘ | " | ....... | " | 2 | " | 49⅘ | " |
| 12 | " | = | 185⅕ | " | ....... | " | 3 | " | 5⅕ | " |
| 13 | " | = | 200⅗ | " | ........ | " | 3 | " | 20⅗ | " |
| 14 | " | = | 216 | " | ........ | " | 3 | " | 36 | " |
| 15 | " | = | 231⅖ | " | ........ | " | 3 | " | 51⅖ | " |
| 16 | " | = | 247 | " | ........ | " | 4 | " | 7 | " |
| 17 | " | = | 262⅖ | " | ........ | " | 4 | " | 2 ⅖ | " |
| 18 | " | = | 277⅘ | " | ........ | " | 4 | " | 37⅘ | " |
| 19 | " | = | 293⅕ | " | ........ | " | 4 | " | 53⅕ | " |
| 20 | " | = | 308⅗ | " | ........ | " | 5 | " | 8⅗ | " |
| 30 | " | = | 463 | " | ........ | " | 7 | " | 43 | " |
| 40 | " | = | 617⅕ | " | ........ | " | 10 | " | 17⅕ | " |
| 50 | " | = | 771⅗ | " | ........ | " | 12 | " | 51⅗ | " |
| 60 | " | = | 926 | " | ........ | " | 15 | " | 26 | " |
| 70 | " | = | 1080⅕ | " | ........ | " | 18 | " | 0⅕ | " |
| 80 | " | = | 1234⅗ | " | ........ | " | 20 | " | 34⅗ | " |
| 90 | " | = | 1389 | " | ........ | " | 23 | " | 9 | " |
| 100 | " | = | 1543⅕ | " | ........ | " | 25 | " | 43⅕ | " |
| 1000 | " | = | 1 kilogram = 32 oz., 1 dr., 12⅖ gr. | | | | | | | |

## "Uniform System" Numbers for Stops from $\frac{f}{1}$ to $\frac{f}{100}$.

In the following table Mr. S. A. Warburton has calculated the exposure necessary with every stop from $\frac{f}{1}$ to $\frac{f}{100}$ compared with the unit stop of the "uniform system" of the Photographic Society of Great Britain. The figures which are underlined show in the first column what $\frac{f}{a}$ must be in order to increase the exposure in geometrical ratio from $\frac{f}{4}$, the intermediate numbers showing the uniform system number for any other aperture.

| $f$ | U. S. No. | $f$ | U. S. No. | $f$ | U. S. No. |
|---|---|---|---|---|---|
| 1 | $\frac{1}{16}$ | 15 | 14.06 | 58 | 210.25 |
| 1¼ | .097 | 16 | 16 | 59 | 217.56 |
| 1.414 | ⅛ | 17 | 18.06 | 60 | 225.00 |
| 1½ | .140 | 18 | 20.25 | 61 | 232.56 |
| 1¾ | .191 | 19 | 22.56 | 62 | 240.25 |
| 2 | ¼ | 20 | 25.00 | 63 | 248.06 |
| 2¼ | .316 | 21 | 27.56 | 64 | 256 |
| 2½ | .390 | 22 | 30.25 | 65 | 264.06 |
| 2.828 | ½ | 22.62 | 32 | 66 | 272.25 |
| 2¾ | .472 | 23 | 33.06 | 67 | 280.56 |
| 3 | .562 | 24 | 36.00 | 68 | 289.00 |
| 3¼ | .660 | 25 | 39.06 | 69 | 297.56 |
| 3½ | .765 | 26 | 42.25 | 70 | 306.25 |
| 3¾ | .878 | 27 | 45.56 | 71 | 315.06 |
| 4 | 1.00 | 28 | 49.00 | 72 | 324.00 |
| 4¼ | 1.12 | 29 | 52.56 | 73 | 333.06 |
| 4½ | 1.26 | 30 | 56.25 | 74 | 342.25 |
| 4¾ | 1.41 | 31 | 60.06 | 75 | 351.56 |
| 5 | 1.56 | 32 | 64 | 76 | 361.00 |
| 5¼ | 1.72 | 33 | 68.06 | 77 | 370.56 |
| 5½ | 1.89 | 34 | 72.25 | 78 | 380.25 |
| 5.656 | 2 | 35 | 76.56 | 79 | 390.06 |
| 5¾ | 2.06 | 36 | 81.00 | 80 | 400.00 |
| 6 | 2.25 | 37 | 85.56 | 81 | 410.06 |
| 6¼ | 2.44 | 38 | 90.25 | 82 | 420.25 |
| 6½ | 2.64 | 39 | 95.06 | 83 | 430.56 |
| 6¾ | 2.84 | 40 | 100.00 | 84 | 440.00 |
| 7 | 3.06 | 41 | 105.06 | 85 | 451.56 |
| 7¼ | 3.28 | 42 | 110.25 | 86 | 462.25 |
| 7½ | 3.51 | 43 | 115.56 | 87 | 473.06 |
| 7¾ | 3.75 | 44 | 121.00 | 88 | 484.00 |
| 8 | 4 | 45 | 126.56 | 89 | 495.06 |
| 8¼ | 4.25 | 45.25 | 128 | 90 | 506.25 |
| 8½ | 4.51 | 46 | 132.25 | 90.50 | 512 |
| 8¾ | 4.78 | 47 | 138.06 | 91 | 517.56 |
| 9 | 5.06 | 48 | 144.00 | 92 | 529.00 |
| 9¼ | 5.34 | 49 | 150.06 | 93 | 540.56 |
| 9½ | 5.64 | 50 | 156.25 | 94 | 552.25 |
| 9¾ | 5.94 | 51 | 162.56 | 95 | 564.06 |
| 10 | 6.25 | 52 | 169.00 | 96 | 576.00 |
| 11 | 7.56 | 53 | 175.56 | 97 | 588.06 |
| 11.31 | 8 | 54 | 182.25 | 98 | 600.25 |
| 12 | 9.00 | 55 | 189.06 | 99 | 612.56 |
| 13 | 10.56 | 56 | 196.00 | 100 | 625.00 |
| 14 | 12.25 | 57 | 203.06 |  |  |

## Comparative Exposures of Various Subjects.

| | Seconds. |
|---|---|
| Open panorama, with fields and trees | 1 |
| Snow, ice, marine views | 1 |
| Panorama, with houses, etc. | 2 |
| Banks of rivers | 3 |
| Groups and portraits in open air (diffused light) | 6 |
| Underneath open trees | 6 |
| Groups under cover | 10 |
| Beneath dense trees | 10 |
| Ravines, excavations | 10 |
| Portraits in light interiors | 10 |
| Portraits taken 4 feet from a window, indoors, diffused light | 30 |

## A Table Showing the Correct Exposure that Should be Given for Various Moving Objects.

By W. D. Kilbey.

The table is made out for a distance from the camera 100 times that of the focus of the lens; that is, for a 6-inch focus lens at 50 feet, a 7-inch at 58 feet, an 8-inch at 67 feet, a 9-inch at 75 feet, or 12-inch at 100 feet.

| | Towards the Camera. | At Right Angles to the Camera |
|---|---|---|
| Man walking slowly, street scenes | $\frac{1}{15}$ sec. | $\frac{1}{45}$ sec. |
| Cattle grazing | $\frac{1}{15}$ " | $\frac{1}{45}$ " |
| Boating | $\frac{1}{20}$ " | $\frac{1}{60}$ " |
| Man walking, children playing, etc. | $\frac{1}{40}$ " | $\frac{1}{120}$ " |
| Pony and trap, trotting | $\frac{1}{100}$ " | $\frac{1}{300}$ " |
| Cycling, ordinary | $\frac{1}{100}$ " | $\frac{1}{300}$ " |
| Man running a race and jumping | $\frac{1}{150}$ " | $\frac{1}{450}$ " |
| Cycle racing | $\frac{1}{200}$ " | $\frac{1}{600}$ " |
| Horses galloping | $\frac{1}{200}$ " | $\frac{1}{600}$ " |

If the object is twice the distance, the length of allowable exposure is doubled, and *vice versa.*

## Freezing Mixtures.

| PARTS. Reducing the Temperature | From Degrees of the Celsius | To Thermometer |
|---|---|---|
| 3 Nitrate of sodium + 4 Water | + 13.2 deg. | — 5.3 deg. |
| 9 Phosphate of sodium + 4 dilute Nitric acid | + 10 " | — 9 " |
| 3 Sulphate of sodium + 2 dilute Nitric acid | + 10 " | —10 " |
| 1 Nitrate of sodium + 4 Water | .......... | —10.6 " |
| 1 Chloride of potassium + 4 Water | .......... | —11.8 " |
| 5 Sal ammoniac + 5 Saltpetre + 16 Water | + 10 deg. | —12 " |
| 1 Nitrate of ammonia + 1 Water | + 10 " | —15.5 " |
| 8 Sulphate of sodium + 5 conc. Sulphuric acid. | + 10 " | —17 " |
| 1 Sulphocyanate of Potass. + 1 Water | + 18 " | —21 " |
| 1 Chloride of sodium + 3 Snow | .......... | —21 " |
| 1 Sal ammoniac + 1 Saltpetre + 1 Water | + 8 deg. | —24 " |
| 3 Crystal. chloride of calcium + 1 Snow | .......... | —36 " |
| 1 Snow + 1 dilute Sulphuric acid | — 5 deg. | —41 " |

# AMERICAN PHOTOGRAPHIC SOCIETIES.

AKRON CAMERA CLUB.—Akron, Ohio. Established 1890. Headquarters, Dobson Block. Membership, 30. Date of meetings, second and last Tuesday in each month. *President*, Rev. E. G. Mason, 262 Spicer Street. *Secretary*, John W. Schuler, 150 Park Place. Date of annual exhibition, unsettled.

ALTOONA CAMERA AND ART CLUB.—Altoona, Pa. Established October, 1900. Headquarters, Mechanics' Library. Membership, 12. Date of meetings, first and third Tuesday in each month. *President*, Horace R. Smith, M.D. *Secretary*, W. J. Hamer. Date of annual exhibition, November.

AMATEUR PHOTOGRAPHIC ASSOCIATION.—Selma, Ala. Established December 29, 1887. Headquarters, 916 Broad Street. Membership, 20. Date of meetings, first Thursday each month. *President*. William S. Monk, Selma, Ala. *Secretary*, S. Orlando Trippe, Selma, Dallas Co., Alabama.

AMERICAN INSTITUTE (PHOTOGRAPHIC SECTION).—New York City. Established March 26, 1859. Headquarters, 19-21 West 44th Street. *President*, Oscar G. Mason. *Vice-President*, Robert A. B. Dayton. *Treasurer*, James Y. Watkins. *Secretary*. John W. Bartlett, M.D., F. R. P. S., 149 West 94th Street.

AMERICAN LANTERN SLIDE INTERCHANGE—New York. Principal office, 361 Broadway. Organized 1885. *General Manager*, F. C. Beach. To interchange twelve sets of slides every month (except July and August) among the clubs comprising the Interchange.

ATHENS CAMERA CLUB.—Athens, Pa. Established May, 1901. Headquarters, 311 South Main Street. Membership, 15. Date of meetings, every Wednesday. *President*, Louis J. Fitler, 120 South Keystone Avenue, Sayre, Pa. *Secretary*, Irving K. Park, 707 South Main Street, Athens, Pa.

ASACOG CAMERA CLUB.—Brooklyn, N. Y. Established April 10, 1901. Not incorporated. Headquarters, 52 Sands Street. Date of meetings, every Wednesday evening, 8 o'clock. *President*, George Creighton, 21 Water Street. *Secretary*, Eivar Harris, 101 Bridge Street. Date of annual exhibition, unsettled.

ASSOCIATION CAMERA CLUB—Marion, Ohio. Established April, 1900. Headquarters, Y. M. C. A. Building. Membership, 19. Date of meetings, first and third Tuesday in each month. *President*, O. E. Kennedy. *Secretary*, H. J. Mantz. Exhibitions at Y. M. C. A., January 1st.

BANGOR CAMERA CLUB.—Bangor, Me. Established April, 1901 Membership 20. *President*, F. L. Sekenger. *Secretary*, A. S. Allen, 48 Hammond Street (P. O. Box 815).

BAY SHORE CAMERA CLUB.—Bay Shore, L. I. Established 1899. Headquarters, Robbins Block. Membership, 67. Date of meetings, second Monday in each month. *President*, Howard M. Ross. *Secretary*, Howard R. Glutzbeck, Bay Shore, L. I. Exhibitions, annually.

BOSTON CAMERA CLUB.—Boston, Mass. Established 1881. Incorporated, 1886. Headquarters, 50 Bromfield Street, Boston, Mass. Membership, 120. Date of meetings, first Mondays. *President*, William R. Cabot, 141 Milk Street, Boston. *Secretary*, John H. Thurston, 50 Bromfield Street. Date of annual exhibition, spring.

BROCKTON CAMERA CLUB.—Brockton, Mass. Established April, 1894. Headquarters, Arcade Building. Membership, 50. Date of meetings, third Friday each month. *President*, S. H. Eaton, 128 Winfield Road. *Secretary*, George W. Higgins, 34 Commercial Street, Brockton. Date of annual exhibition, third Friday in April.

BROOKLYN ACADEMY OF PHOTOGRAPHY—Brooklyn, N. Y. Organized and incorporated February 16, 1887. Headquarters, 177 Montague Street. Membership, 60. Date of meetings, first Monday in each month. *President*, Dr. John Merritt. *First Vice-President*, A. N. Cook. *Second Vice-President*, M. R. Jones. *Recording Secretary*, H. W. Hodges. *Corresponding Secretary*, G. A. Williams. *Treasurer*, Wm. I. Wintringham. *Librarian*, Russell E. Prentiss. Date of annual exhibition, in May.

BROOKLYN CAMERA CLUB.—Brooklyn. Established February 2, 1900. Incorporated February 19, 1900. Headquarters, 776 Manhattan Avenue. Membership, 41. Date of meetings, first Wednesday each month. *President*, Wm. T. Knol, 279 Washington Street, New York City. *Secretary*, N. Grant Dodson, 150 Noble Street. Date of annual exhibition, April 1.

BUFFALO CAMERA CLUB.—Buffalo, N. Y. Established October, 1899. Headquarters, Central Y. M. C. A. Building. Membership, 75. Date of meetings, second and fourth Thursday of the month. *President*, W. H. Porterfield, 235 Hudson Street, Buffalo, N. Y. *Secretary*, S. S. Lloyd, 827 Prospect Avenue, Buffalo, N. Y. Date of annual exhibition, shortly after January 1st.

CALIFORNIA CAMERA CLUB.—San Francisco, Cal. Established March 18, 1890. Incorporated April 5, 1890. Headquarters, California Academy of Sciences Building, San Francisco, Cal. Membership, total April 30, 1905, 415. Date of meetings, second Tuesday monthly. *President*, E. G. Eisen, D. D. S., 819 Market Street, Room 58. *Secretary*, W. E. Dassonville, 819 Market Street, Room 58, San Francisco, Cal. Date of annual exhibition, no set time.

CAMERA CLUB OF HARTFORD.—Hartford, Conn. (Our affiliation with the Scientific Society ceased October 1st) Incorporated—We are taking up the old charter and name of The Camera Club of Hartford. Headquarters, not decided upon. Membership, about 100. *President*, Dr. F. S. Crossfield, 75 Pratt Street. *Secretary*, Clarence M. Rodgers, care of Hartford Steam Boiler I. & I. Co. Date of annual exhibition, April.

"CAMERADS."—New Brunswick, N. J. Established April 24, 1890. Headquarters, corner Church and Neilson Streets. Membership, 30. *President*, Geo. K. Parsell, George Street. *Secretary*, Harvey Iredell, D. D. S., Lock Box, 34 New Brunswick, N. J.

CAPE ANN CAMERA CLUB.—119 Main Street, Gloucester. Established June 5, 1899. Incorporated December 26, 1903. Headquarters, 119 Main Street. Membership, 40 (limited to 40). Date of meetings, first and third Friday in month. *President*, Dr. Percy C. Proctor, Gloucester, Mass. *Secretary*, Herman W. Spooner, Gloucester, Mass. Date of annual exhibition, third week of November.

CAPITAL CAMERA CLUB.—Washington, D. C. Established May 1, 1891. Headquarters, 1010 F Street, N. W. Membership, limited to 100. Date of meetings, first Saturday in each month. *President*, Wm. F. Peabody, 918 L Street, N. W. *Secretary*, Miss Kate S. Curry, 1510 Ninth Street, N. W. Date of annual exhibition, April.

CENTRAL BRANCH.—502 Fulton Street, Brooklyn. Established 1890. Incorporated 1890. Headquarters, 502 Fulton Street. Membership, 37. Date of meetings, first and third Monday of each month. *President*, M. F. C. Surbeck, 99 Second Place, Brooklyn, N. Y. *Secretary*, Addison H. Ely, 185 Schermerhorn Street, Brooklyn. Date of annual exhibition, in the fall.

CENTRAL CAMERA CLUB.—Brooklyn, N. Y. Established 1889. Headquarters, 502 Fulton Street. Membership, 42. Date of meetings, first and third Monday of each month. *President*, George H. Kutz. *Vice-President*, F. W. Surbeck. *Secretary*, Wm. S. Cole. *Treasurer*, John L. Freedlund. Date of annual exhibition, last week in October.

CENTURY CAMERA CLUB.—Erie, Pa. Established 1900. Headquarters, 2207 Poplar Street. Date of meetings, second and fourth Tuesday of each month. *President*, Bert Gerred. *Secretary*, Gust. Holmquist, 2207 Poplar Street. Exhibitions, every quarter.

CHELTEN HILLS PHOTOGRAPHIC CLUB—Jenkintown, Penna. Membership, 25. *President*, J. W. Ridpath, 437 York Avenue, Jenkintown. *Treasurer*, R. S. Naylor, Wyncote, Pa. Second annual exhibition held in Library Rooms, March, 1905; 150 pictures hung by 21 exhibitors.

CHICAGO CAMERA CLUB.—Chicago, Ill. Established February 14, 1904. Incorporated February 19, 1904. Headquarters, Northwestern University Building, Dearborn and Lake Streets. Date of meetings, second and fourth Thursday of each month. *President*, William P. Gunthrop, 116 Randolph Street. *Secretary*, E. W. Thomas, 84 Adams Street. Date of annual exhibition in December, at Art Institute, Chicago.

CLEVELAND CAMERA CLUB.—Cleveland, Ohio. Established May 22, 1902. Incorporated June 9, 1902. Headquarters, 625 Caxton Building. Membership, about 50. Date of meetings, second and fourth Wednesdays each month. *President*, C. F. Dixon, care of Ohio Mutual Savings and Loan Co. *Secretary*, Chas. S. Bourgeois, 11 Ware Street. Date of annual exhibition, about September.

COLUMBIAN PHOTO-AMATEUR EXCHANGE—Seattle, Wash. Established 1893. Limited membership of fifteen. *President*, A. H. Waite, Seattle, Wash. *Secretary*. W. E. Dickinson, Osage, Iowa. Exchange prints quarterly.

COLUMBIA PHOTOGRAPHIC SOCIETY.—Philadelphia, Pa. Established 1889. Incorporated July 3, 1894. Headquarters, 1811 North Broad Street, Philadelphia. Membership, 150. Date of meetings, first Monday each month, business meetings; other Mondays, lecture or demonstrations. *President*, Dr. G. J. R. Miller, 1769 Frankford Avenue. *Secretary*, Daniel Baker, 1919 North 25th Street. Date of annual exhibition, January, prints. November, lantern slides.

COLUMBUS CAMERA CLUB—Columbus, Ohio. Date of meetings, every Tuesday evening. Membership, 25. *President*, J. E, Stearns. *Secretary*. W. W. Thune, 1158 Oak Street.

CROSS COUNTRY CAMERA CLUB.—Hyde Park, Mass. Organized 1898. Headquarters, Unity Building. Date of meetings, second Tuesday in each month. *President*, George H. Rausch. *Secretary*, Frank R. Heustis. Talks and demonstrations are given from time to time. Meetings every Saturday night for informal discussion. Annual exhibition in May.

DAGUERRE CAMERA CLUB—Harbert, Mich. Established 1893. Headquarters, Harbert, Mich. Membership, about 25. Date of meetings, first Monday of month. *President*, F. Blish, Chicago. *Secretary*, Wells Sizer, Harbert, Mich. Date of annual exhibition, this year September 1.

EAST END CAMERA CLUB.—Established April, 1900. Headquarters, Institute Rooms, Cedar Avenue, opposite Bertram Street. Membership, 30. Date of meetings, first Tuesday in each month. *President*, E. Sanderson. *Secretary*, A. S. Smith, 37 Kenwood Street.

EASTERN CAMERA CLUB.—239 East 104th Street, New York. Established October, 1900. Headquarters, 241 East 104th Street, N. Y. Membership, 25. Date of meetings, first and third Tuesdays of month *President*, A. W. Warden, 239 East 104th Street, New York. *Secretary-Treasurer*, Irving Bender, 239 East 118th Street, New York. Date of annual exhibition, indefinite (probably in October, 1905).

ESSEX CAMERA CLUB.—Newark, N. J. Established April, 1901. Headquarters, 33 Court Street, Newark, N. J. Membership, 50. Date of meetings, fourth Tuesday of every month. *President*, Charles E. Moody, 1 Marshall Street. *Secretary*, Wm. H. Goulden, 95 Orchard Street, Newark, N. J. Date of annnal exhibition, usually in February.

GREENVILLE CAMERA CLUB.—Jersey City, N. J. Established January, 1899. Headquarters, Club House at Greenville Schuetzen Park. Membership 17 (limited to 20). Date of meetings, first Sunday in each month. *President*, William Rabidoux. *Secretary*, A. A. Langer, 116 Danforth Avenue. Semi-annual lantern-slide exhibitions, spring and fall.

HAMILTON SCIENTIFIC ASSOCIATION, CAMERA SECTION.—Hamilton, Ont. Established April, 1891. Headquarters, Library Building, Main Street, West. Membership, 80. Date of meetings, second and fourth Mondays. *President*, James G. Gadsby, 314 Caroline Street, South. *Secretary*, Sinclair G. Richardson, Traders' Bank Building, King Street, West. Date of annual exhibition, last week of March.

HAVERHILL CAMERA CLUB.—Haverhill, Mass. Established 1898. Headquarters, Daggett Building, Merrimack Street. Membership, 33 active; 1 honorary. Date of meetings, third Tuesday, monthly. *President*, L. O. Philbrick, 108 Washington Street. *Secretary*, A. P. Heath, 104⅛ Merrimack Street. Date of annual exhibition, no set date.

HYDE PARK CAMERA CLUB.—Hyde Park, Mass. Established May, 1905. Headquarters, Y. M. C. A. Building. Date of meetings, first Tuesday of each quarter, January, April, July, October. *President*, Rev. William F. Dusseault, Hyde Park. *Secretary*, Alexander Carberry, Y. M. C. A., Hyde Park.

INTERNATIONAL PHOTOGRAPHIC EXCHANGE.—San Francisco, Cal. Established February 21st, 1898. Headquarters, San Francisco, Cal. Membership, 1,400. A monthly publication, *The Photographic Exchange*, sent to all members. *President*, G. C. Kirkland, 3404 Franklin Street, Denver, Col. *Secretary*, Fayette J. Clute, Marye Terrace, San Franciso, Cal.

KENSINGTON CAMERA CLUB.—Philadelphia, Pa. Established April, 1900. Reorganized April, 1903. Headquarters, 2832 Kensington Avenue. Membership, limited to 25. Date of meetings, second Tuesday in each month. *President*, Alfred Clegg. *Secretary*, Henry Elcock, 2422 N. Reese Street. Demonstrations and exhibitions, first, third and fourth Tuesday of each month, except June, July and August.

LANCASTER CAMERA CLUB.—Lancaster, Pa. Established May 15, 1895. Headquarters, Rooms of Walter Meiser, West King Street. Membership 13. Date of meetings, first Thursday in each month. *President*, William S. Gleim. *Secretary*, F. A. Demuth, 114 East King Street.

LAWRENCE CAMERA CLUB—Lawrence, Mass. Established February 28, 1898. Headquarters (for correspondence), 29 Valley Street. Membership, 7. Date of meetings, second Monday of every month; annual meeting; second Monday in March. *President*, Robert D. Stevens. *Secretary*, William J. Prince, 29 Valley Street.

LOS ANGELES CAMERA CLUB.—Los Angeles, Cal. Established December 1899. Incorporated May 1, 1900. Headquarters, 321 South Hill Street. Membership, 100. Date of meetings, second and fourth Friday in each month; social meetings, third Friday, *President*, F. Hammer Maude. *Corresponding Secretary*, Helen L. Davie.

MANCHESTER (N. H.) CAMERA CLUB.—Manchester, N. H. Established March, 1898. Headquarters, 64 Hanover Street. Membership, 27. Date of meetings, first and third Wednesday of each month. *President*, James E. Currier, 225 Bridge Street, Manchester, N. H. *Secretary*, Fred T. Irwin, 48 Hanover Street, Manchester, N. H. Date of annual exhibition, no stated time.

MANUAL TRAINING HIGH SCHOOL CAMERA CLUB.—Brooklyn, N. Y. Established 1895. Headquarters, 76 Court Street, room 18 in School Building. Membership. 65; alumni membership, 55. Date of meetings, first and third Thursday in each month. *President*, Richard Claggell. *Secretary*, Robert Redlefson, Manual Training High School. Exhibitions, Christmas vacation.

MEADVILLE CAMERA CLUB.—Meadville, Pa. Established June, 1889. Meet at residence of members. Membership, 24. Date of meetings, last Friday of each month. *President*, P. B. Graham. *Secretary*, Miss Mary Brunett.

METROPOLITAN CAMERA CLUB.—New York City. Established 1903. Incorporated 1904. Headquarters, 100-102 West 101 Street, New York. Membership, 150. Date of meetings, first Monday each month. *President*, Curtis Bell, 558 Fifth Avenue. *Secretary*, S. C. Bullenkamp, 102 West 101st Street. Date of annual exhibition, December.

MINNEAPOLIS CAMERA CLUB.—Minneapolis, Minn. Established 1892. Incorporated 1892. Headquarters, Public Library. Date of meetings, first and third Tuesday each month, from September to May. *President*, H. E. Murdock, Commercial Building, Minneapolis, Minn. *Secretary*, C. J. Hibbard, 826 Hennepin Avenue.

MONTCLAIR CAMERA CLUB.—Montclair, N. J. Established November 10, 1898. Incorporated August 5, 1899. Headquarters, Crane Building, 460 Bloomfield Avenue. Membership, 65. Date of meetings, 10th of each month. *President*, Dr. Morgan Wilcox Ayres, 155 Lorraine Avenue. *Secretary*, C. Russell Jacobus, 550 Bloomfield Avenue. Date of annual exhibition, next fall (date not fixed).

MONTREAL CAMERA CLUB.—Montreal, Canada. Headquarters, 44 Victoria Street. Membership, 138. Date of meetings, every Tuesday, October 1 to May 1. *President*, A. W. Cole. *Secretary*, Albert Holden, 30 St. John Street. Exhibitions, annually.

NEWARK CAMERA CLUB.—Newark. N. J. Established April, 1888. Headquarters, 222 Market Street, Newark. N. J. Membership, 62. Date of meetings, second and fourth Monday each month. *President*, R. L. Smith, 107 Pennsylvania Avenue, Newark, N. J. *Secretary*, W. S. Norris, 85 Bleecker Street, Newark, N. J.

NEW ENGLAND PHOTOGRAPHIC EXCHANGE MANAGING SOCIETY.—Ogdensburg, N. Y. Headquarters, The St. Lawrence Camera Club. Membership, Photographic Society of New Haven, Conn.; Providence Camera Club; Taunton, Mass., Camera Club; Manchester. N. H., Camera Club; New Britain, Conn., Camera Club; Mystie Camera Club, Medford, Mass.; Albany, N. Y., Camera Club; St. Lawence Camera Club, Ogdensburg, N. Y. *Exchange Secretary*, John A. Brown, 26 Jay Street, Ogdensburg, N. Y., for the interchange of lantern slides and photographic prints.

ORANGE CAMERA CLUB.—Orange, N. J. Established March 21, 1892. Incorporated May 19, 1893. Headquarters, Decker Building, Orange. Membership, 100. Date of meetings, 5th and 20th of each month. *President*, C. B. Price, 69 Halsted Street, East Orange, N. J. *Secretary*, P. T. Smith, 215 North Grove Street, Orange, N. J. Date of annual exhibitions, fall and spring.

OREGON CAMERA CLUB.—Portland, Ore. Established 1895. Incorporated 1903. Headquarters, 510 Macleay Building. Membership, 140. Date of meetings, second Tuesday each month. *President*, W. B. Struble, care of Oregon Club. *Secretary*, J. J. Tyrrell, 5 East 12th Street. Date of annual exhibition, Thanksgiving week.

PENDLETON CAMERA CLUB.—Pendleton, Ore. Established June 18, 1899. Headquarters, Association Block. Membership, 20. Date of meetings, every Tuesday. *President*, Lee Morehouse. *Secretary*, H. L. Hasbrouek, Pendleton, Ore.

PHOTO-FELLOWS OF THE WATERBURY SCIENTIFIC SOCIETY.—Waterbury, Conn. Established March 20, 1902. Headquarters, 27 East Main Street, Room 9. Membership. 25. Date of meetings, first Monday of each month. *President*, Walter W. Peircey. *Secretary*, Thomas Greenwood, 412 N. Main Street. Exhibitions, third Monday in June and October of each year.

PHOTOGRAPHIC CLUB OF BALTIMORE CITY.—Baltimore, Md. Established 1885. Incorporated 1890. Headquarters, Club House, 870 Linden Avenue, Baltimore. Membership, active, 48; associate, 17; honorary, 6; non-resident, 2; total, 73. Date of meetings, first Tuesday in each month, except July and August, for business meetings. *President*, Percy M. Reeves, 1201 North Charles Street, Baltimore. *Secretary*, Jas. F. Ferguson, 873 Park Avenue, Baltimore. Date of annual exhibitions, spring and autumn.

PITTSBURG ACADEMY OF SCIENCE AND ART OF PITTSBURG.—Pittsburg, Pa. Organized January 23, 1900. Headquarters, Carnegie Institute, Shenley Park. Date of meetings, second and fourth Tuesdays of each month, except July and August. Membership, 100. *President*, W. A. Given. *Vice-President*, R. D. Bruce. *Treasurer-Director*. O. C. Reiter. *Secretary*, J. M. Conner, Shetland and Finley Avenues, Pittsburg.

PORTLAND CAMERA CLUB.—Portland, Me. Established 1899. Headquarters, 571½ Congress Street. Membership, 106. Date of meetings, every Friday evening. *President*, F. H. Thompson, 36 Elm Street, Portland. *Secretary*, O. P. T. Wish, 22 Sherman Street. Date of annual exhibition, in February.

PORTSMOUTH (VA.) CAMERA CLUB.—Portsmouth, Va. Established 1898. Headquarters, 614 Crawford Street. *President*, Wm. Stertzbach, 208 High Street, *Secretary*, H. T. Richardson, 614 Crawford Street.

PROVIDENCE CAMERA CLUB.—Providence, R. I. Established 1883. Incorporated 1889. Headquarters, 152 Weybosset Street. Membership, active, 122; associate, 23; honorary, 1. Date of meetings, annual, second Wednesday in June; club nights, second Wednesday. *President*, C. Lee. *Secretary*, Harry S. Wolfe. Date of annual exhibition, March 16 and 22.

QUEEN'S COUNTY CAMERA CLUB.—Jamaica, L. I. Established July 1, 1901. Headquarters, Bernhard Court, Fulton Street. Membership, 49. Date of meetings, last Saturday of each month. *President*, Dr. H. Noble. *Secretary*, Henry D. Johnson, Jamaica, L. I. Annual exhibition in June.

ROSE TECHNICAL CAMERA CLUB.—Terre Haute, Ind. Established 1897. Headquarters, Rose Polytechnical Institute. Membership, 30. Date of meetings, date arranged about two weeks previous to meetings. *President*, Roy W. Hill. *Secretary*. Leo F. Dorn. Annual exhibition in June.

RUTLAND CAMERA CLUB.—Rutland, Vt. Established October 20, 1888. Headquarters, 149 S. Main Street. Membership, 13. Date of meetings, second and fourth Tuesday in each month. *President*, Cornele G. Ross. *Secretary*, V. F. Worcester, 149 South Main Street, Rutland, Vt.

RUTLEDGE CAMERA CLUB.—Rutledge, Pa. Established June, 1900. Headquarters, room in Rutledge Institute. Date of meetings, second Friday in each month. *President*, J. H. Weeks. *Secretary*, M. B. Wicks, Rutledge, Pa.

SAN DIEGO CAMERA CLUB.—San Diego, Cal. Established May 12, 1900. Headquarters. San Diego Commercial College Rooms, 4th and C Streets. Membership, 5. Date of meetings, third and first Wednesday evenings. *President*, F. W. Kelsey. *Secretary*, Samuel Schiller, 1033 F Street.

SAVANNAH CAMERA CLUB.—Savannah, Ga. Established June, 1897. Headquarters, Park Avenue and Bull Street. Date of meetings, Wednesdays of each week. *President*, B. J. Apple, 117 Bay Street, East. *Secretary*, L. M. Williams, P. O. Box 461. Date of annual exhibition, November 26 and 27.

SUNNYSIDE CAMERA CLUB.—St. Louis, Mo. Established October 10, 1891. Headquarters, 5902 S. Broadway (third floor). Membership, 21. Date of meetings, first and third Thursday in every month. *President* Barthuld W. Blumenthal. *Secretary*, William A. Brichner, 4702 S. Compton Avenue. Exhibitions, annually.

SYRACUSE CAMERA CLUB.—Syracuse, N.Y. Established 1886. Incorporated January 19th, 1892. Headquarters, University Block. Membership, 101. Date of meetings, Friday evening of each week. *President*, J. E. Bierhardt, Western Union Tel. Co. *Secretary*, M. L. Trowbridge, 116 Ulster Street.

TAUNTON CAMERA CLUB.—Taunton, Mass. Established July 11, 1900. Headquarters, 2½ East Brittania Street. Membership, 25 active, 30 associate. Date of meetings, first Tuesday evening each month. *President*. Fred. C. Whitehead. *Secretary*, William A. Bellamy, 34 Winter Street. The Club is a member of the New England Photographic Exchange.

THE ALBANY CAMERA CLUB.—Albany, N. Y. Established October 21, 1887. Incorporated April 27, 1891. Headquarters, 29 Steuben Street. Membership, active, 34; associate, etc., 21. Date of meetings, first Friday in each month, July and August omitted. *President*, Augustus Pruyn, 230 State Street. *Secretary*, Leonard M. Wachter, 67 Walter Street. Date of annual exhibition, usually in January.

"THE CAMERA CLUB."—New York. Established by consolidation of Society of Amateur Photographers and New York Camera Club, in April, 1896. Incorporated May 7, 1896. Headquarters, 5 West 31st Street, New York. Membership, 233. Date of meetings, second Tuesday each month, except July and August. *President*, F. Benedict Herzog, Ph.D., 51 West 24th Street, New York. *Secretary*, E. Lee Ferguson, 71 Lenox Avenue, New York. Date of annual exhibition, annual members' show in April.

THE CAMERA CLUB OF THE TWENTY-THIRD STREET BRANCH Y.M.C.A.—215 West 23d Street, New York. Established June 3, 1904. Headquarters, 23d Street, Y. M. C. A., New York City. Membership, 60. Date of meetings, first Monday each month, business; third Monday each month, social. *President*, William C. Eckman, 215 West 23d Street, New York City. *Secretary*, Frank M. Ingalls, Room 914 23d Street, Y. M. C. A., New York City. Date of annual exhibition, no fixed date.

THE DENVER PHOTOGRAPHIC SOCIETY—Denver, Colo. Established October 26, 1891. Headquarters, Appel Building, 1230 Sixteenth Street. Membership, 91. Date of meetings, general, first Friday in each month; Board of Directors, last Friday in each month. *President*, Thomas E. Morgan. *Vice-President*, Capt. H. D. Smith. *Secretary*, George L. Beam. *Treasurer*, Charles S. Price. Annual exhibition, date set each year.

THE PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.—Philadelphia. Pa. Established November, 1862. Incorporated April 24, 1885. Headquarters, 1722 Arch Street. Membership, 200. Date of meetings. second, third and fourth Wednesdays, 8 p. m. *President*, C. Yarnall Abbott, 43 South 18th Street. *Secretary*, George Donehower, 902-1201 Chestnut Street. Date of annual exhibition, January.

THE POSTAL PHOTOGRAPHIC CLUB.—Washington, D. C. Established December, 1888. Headquarters, Washington, D. C. Membership. 40. Date of meetings, no regular meeting. *President*, Charles E. Fairman, 1006 F Street, N. W. Washington, D. C. *Secretary*, Gustavus A. Brandt. 631 Maryland Avenue, S. W. Washington, D.C. Date of annual exhibition, albums circulate among members monthly, except August and September.

THE ST. LAWRENCE CAMERA CLUB.—Ogdensburg, N. Y. Established 1900. Headquarters, 26 Jay Street. Ogdensburg, N. Y. Membership, 12. Date of meetings, at the call of the Secretary. *President*, Arthur L. Jameson, 50 State Street. *Secretary*, John N. Brown, 26 Jay Street.

THE TROY CAMERA CLUB.—Troy, N. Y. Established February 22, 1904. Headquarters, Room 250 River Street. Membership, 121. Date of meetings, first Monday each month. *President*, William C. Roberts. *Secretary*, Albert A. MacNaughton, P. O. Box 58, Troy, N. Y.

TORONTO CAMERA CLUB.—Toronto, Can. Established 1887. Incorporated 1893. Headquarters, Forum Building, Yonge Street, Toronto, Can. Membership, 180. Date of meetings, every Monday, from October to April inclusive. *President*, John Manghan, Jr., 98 Wellington Place. *Secretary-Treasurer*, Hugh Neilson, 295 Carlton Street. Date of annual exhibition, March or April.

TOWN AND COUNTRY CLUB.—Minneapolis. Minn. Established 1901. Date of meetings, every week, at which lectures are given pertaining to camera work. *President*, George L. Nevins. *Secretary*, Melvin W. Wright. Exhibition annually.

TRENTON PHOTOGRAPHIC SOCIETY.—Trenton, N. J. Established January 7, 1898. Incorporated April 30, 1898. Headquarters, 132 East State Street. Membership, 47. Date of meetings, second Monday evening in each month. *President*, John S. Neary. 10 West Front Street. *Secretary*, Edgar D. Coleman, 143 Mercer Street. Date of annual exhibition, no date set.

VALLEY CAMERA CLUB.—Phenix, R. I. Established April, 1896. Headquarters, Phenix, Rhode Island. Membership. 45. Date of meetings, alternate Mondays. *President*, Ward E. Smith, Phenix, R. I. *Secretary*, J. Bancroft Lawton, Phenix, R. I., Box 43. Date of annual exhibition, June.

WALLINGFORD CAMERA CLUB.—Wallingford, Conn. Established 1897. Headquarters, Academy Street. Membership, 27. Date of meetings, third Monday every month. *President*, Lothar Baron von Grave. *Secretary*, F. L. Lathrop, 490 North Main Street, Wallingford, Conn. Exhibition, December.

WASHINGTON CAMERA CLUB.—Tacoma. Wash. Established and incorporated May, 1900. Headquarters, Ferry Museum. Membership, 40. Date of meetings, first Wednesday each month. *President*, Charles Bedford. *Secretary*, W. H. Orilstrap, Ferry Museum, Tacoma, Wash.

Y. M C. A CAMERA CLUB.—Denver, Col. Established September, 1899. Headquarters, Y. M. C. A. Membership, 30. Date of meetings, last Friday each month. *President*, Irving W Laninae, Y. M. C. A., Denver. *Secretary*, Henry Huntington, MacPhee Building, Denver. Date of annual exhibition, first week in December.

Y. M. C. A. CAMERA CLUB.—Los Angeles, Cal. Established June 5, 1901. Headquarters. Y. M. C. A., Los Angeles, Cal. Membership, 20. Date of meetings, first Wednesday every month. *President*, Edward G. Witt. *Secretary*, Charles E Stanton, 439-41 S. Main Street, Los Angeles, Cal.

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Copyrights shall be granted for the term of twenty-eight years from the time of recording the title thereof.

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No person shall be entitled to a copyright unless he shall, on or before the day of publication, in this or any foreign country, deliver at the office of the Librarian of Congress, or deposit in the mail within the United States, addressed to the Librarian of Congress, at Washington, District of Columbia, a printed copy of the title of the PHOTOGRAPH, for which he desires a copyright ; nor unless he shall also, not later than the day of the publication thereof, in this or any foreign country, deliver at the office of the Librarian of Congress, at Washington, District of Columbia, or deposit in the mail, within the United States, addressed to the Librarian of Congress, at Washington, District of Columbia, two copies of such copyright PHOTOGRAPH : Provided, That in the case of a PHOTOGRAPH, the two copies of the same required to be delivered or deposited as above, shall be printed from NEGATIVES made within the limits of the United States, or from transfers made therefrom. During the existence of such copyright the importation into the United States of any PHOTOGRAPH, so copyrighted, or any edition or editions thereof, or any negatives not made within the limits of the United States, shall be, and is hereby prohibited.

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Every person who shall impress such notice, or words of the same import, upon any PHOTOGRAPH for which he has not obtained a copyright, or shall knowingly issue or sell any PHOTOGRAPH bearing a notice of United States copyright which has not been copyrighted in this country; or shall import any PHOTOGRAPH, etc., bearing such notice of copyright, or words of the same purport, which is not copyrighted in this country, shall be liable to a penalty of one hundred dollars; and the importation into the United States of any PHOTOGRAPH bearing such notice of copyright, when there is no existing copyright thereon in the United States, is prohibited.

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LIST OF THE COUNTRIES WITH WHICH THE UNITED STATES HAVE ESTABLISHED COPYRIGHT RELATIONS.

July 1, 1891.—Belgium, France, Great Britain and her possessions, and Switzerland.
April 15, 1892.—Germany.
October 31, 1892.—Italy.
May 8, 1893.—Denmark.
July 20, 1893.—Portugal.
July 10, 1895.—Spain.
February 27, 1896.—Mexico.
May 25, 1896.—Chile.
October 19, 1899.—Costa Rica.
November 20, 1899.—Netherlands (Holland) and her possessions.

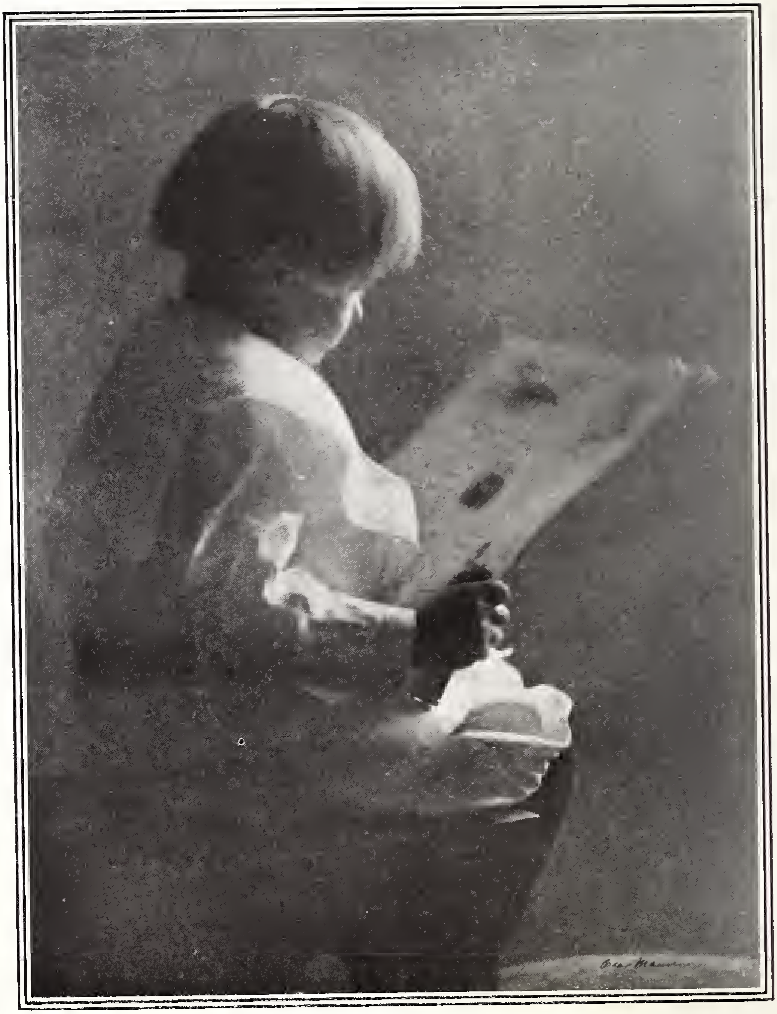
## Table Showing Displacement on Ground Glass of Objects in Motion.

By HENRY L. TOLMAN.

[Republished, with corrections, from the *Photographic Times*.]

LENS 6 IN. EQUIV. FOCUS, GROUND GLASS AT PRINCIPAL FOCUS OF LENS.

| Miles per Hour. | Feet per Second. | Distance on Ground Glass, in inches, with Object 30 Feet away. | Same with Object 60 Feet away. | Same with Object 120 Feet away. |
|---|---|---|---|---|
| 1 | 1½ | .29 | .15 | .073 |
| 2 | 3 | .59 | .29 | .147 |
| 3 | 4½ | .88 | .44 | .220 |
| 4 | 6 | 1.17 | .59 | .293 |
| 5 | 7½ | 1.47 | .73 | .367 |
| 6 | 9 | 1.76 | .88 | .440 |
| 7 | 10½ | 2.05 | 1.03 | .513 |
| 8 | 12 | 2.35 | 1.17 | .587 |
| 9 | 13 | 2.64 | 1.32 | .660 |
| 10 | 14½ | 2.93 | 1.47 | .733 |
| 11 | 16 | 3.23 | 1.61 | .807 |
| 12 | 17½ | 3.52 | 1.76 | .880 |
| 13 | 19 | 3.81 | 1.91 | .953 |
| 14 | 20½ | 4.11 | 2.05 | 1.027 |
| 15 | 22 | 4.40 | 2.20 | 1.100 |
| 20 | 29 | 5.87 | 2.93 | 1.467 |
| 25 | 37 | 7.33 | 3.67 | 1.833 |
| 30 | 44 | 8.80 | 4.40 | 2.200 |
| 35 | 51 | 10.27 | 5.13 | 2.567 |
| 40 | 59 | 11.73 | 5.97 | 2.933 |



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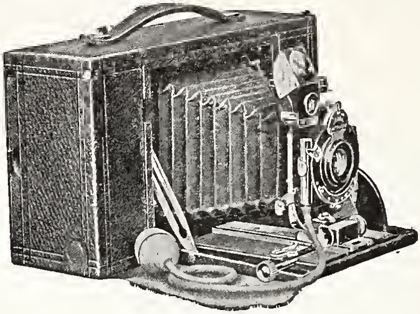

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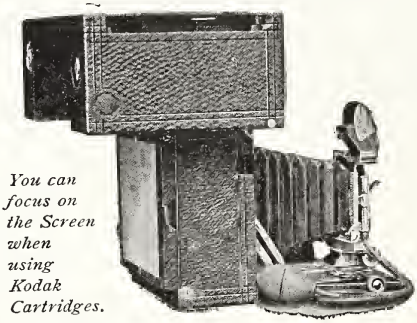

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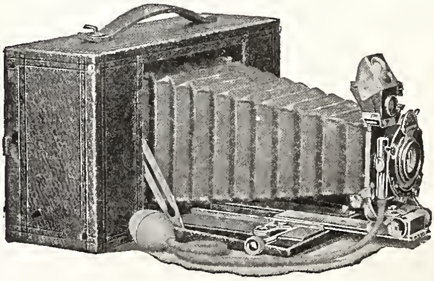

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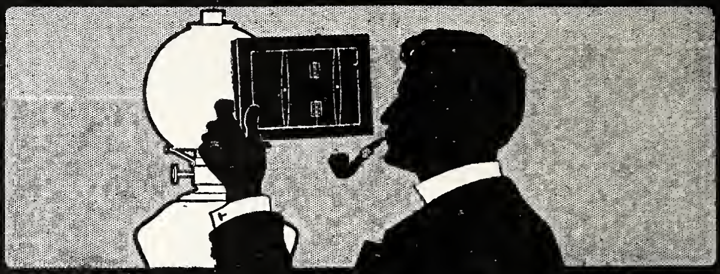

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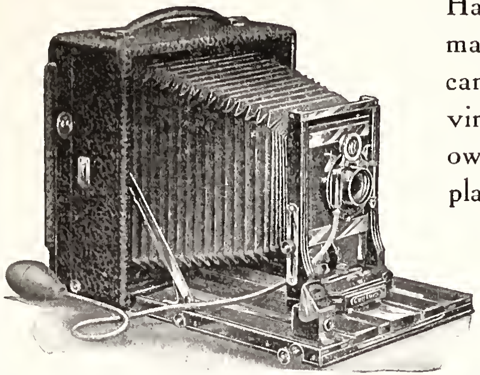

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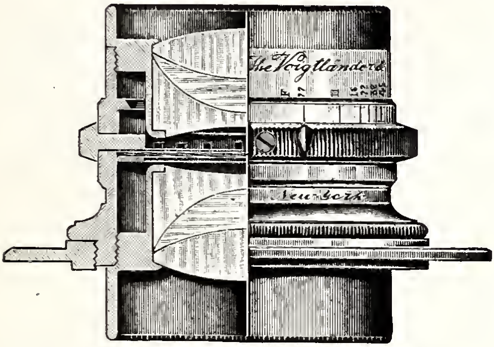

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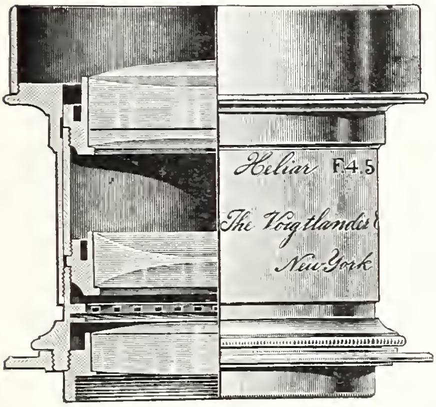

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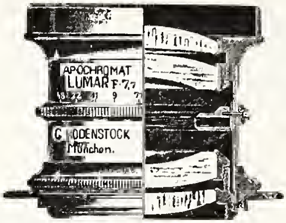

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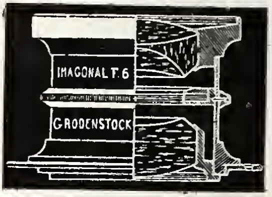

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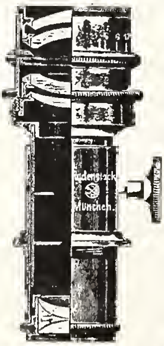

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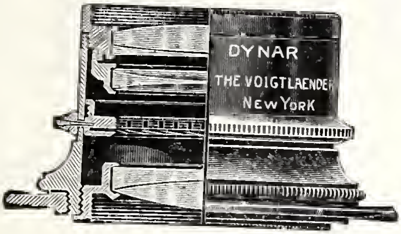

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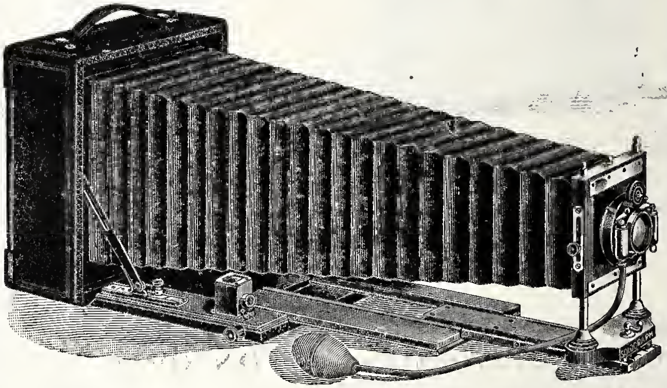

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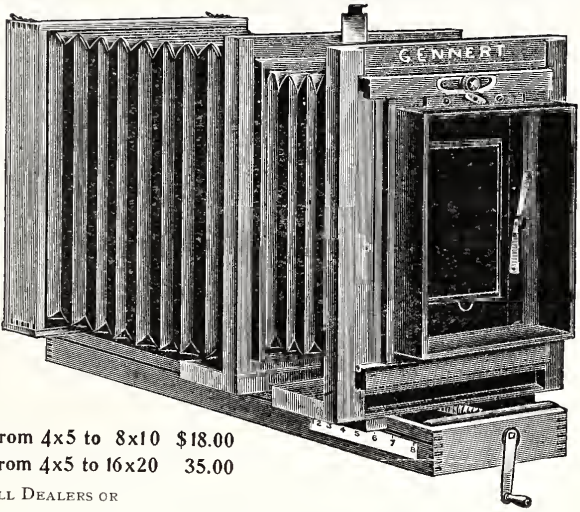

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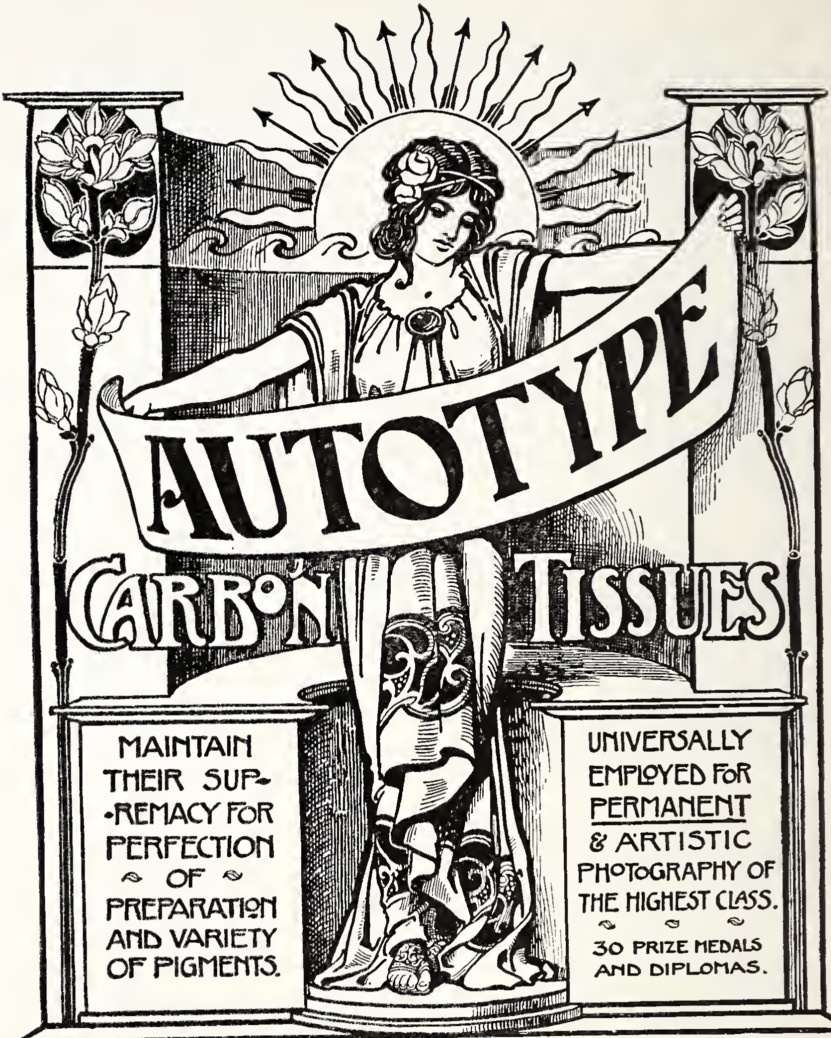
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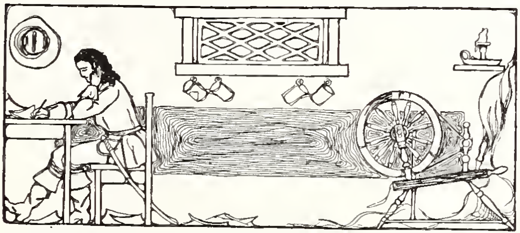

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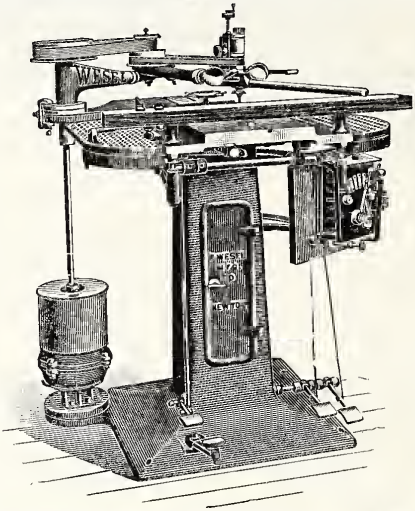

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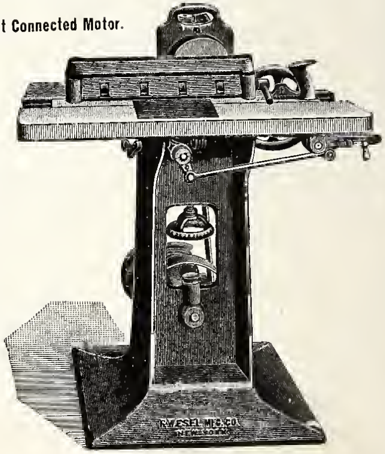

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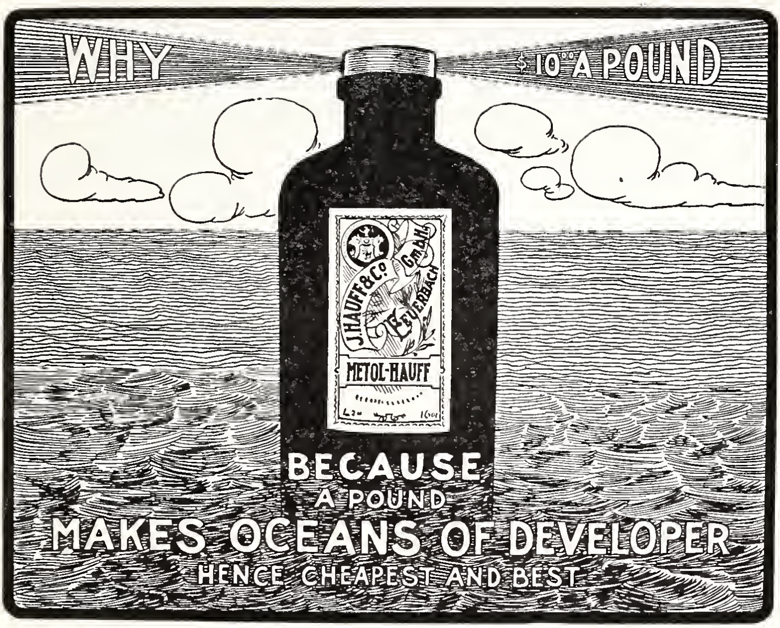

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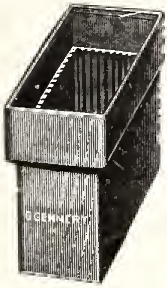

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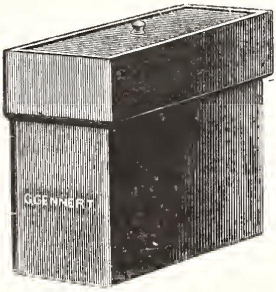

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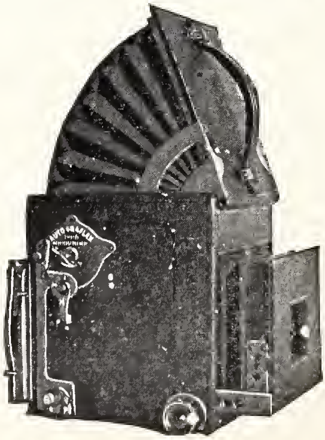

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